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WYOMING

A Complete and Comprehensive Description

OF THE

AGRICULTURAL,

STOCK RAISING AND

MINERAL RESOURCES

OF WYOMING.

Also Statistics in regard to its Climate, etc.,

Compiled from the Latest Reports of 1890.

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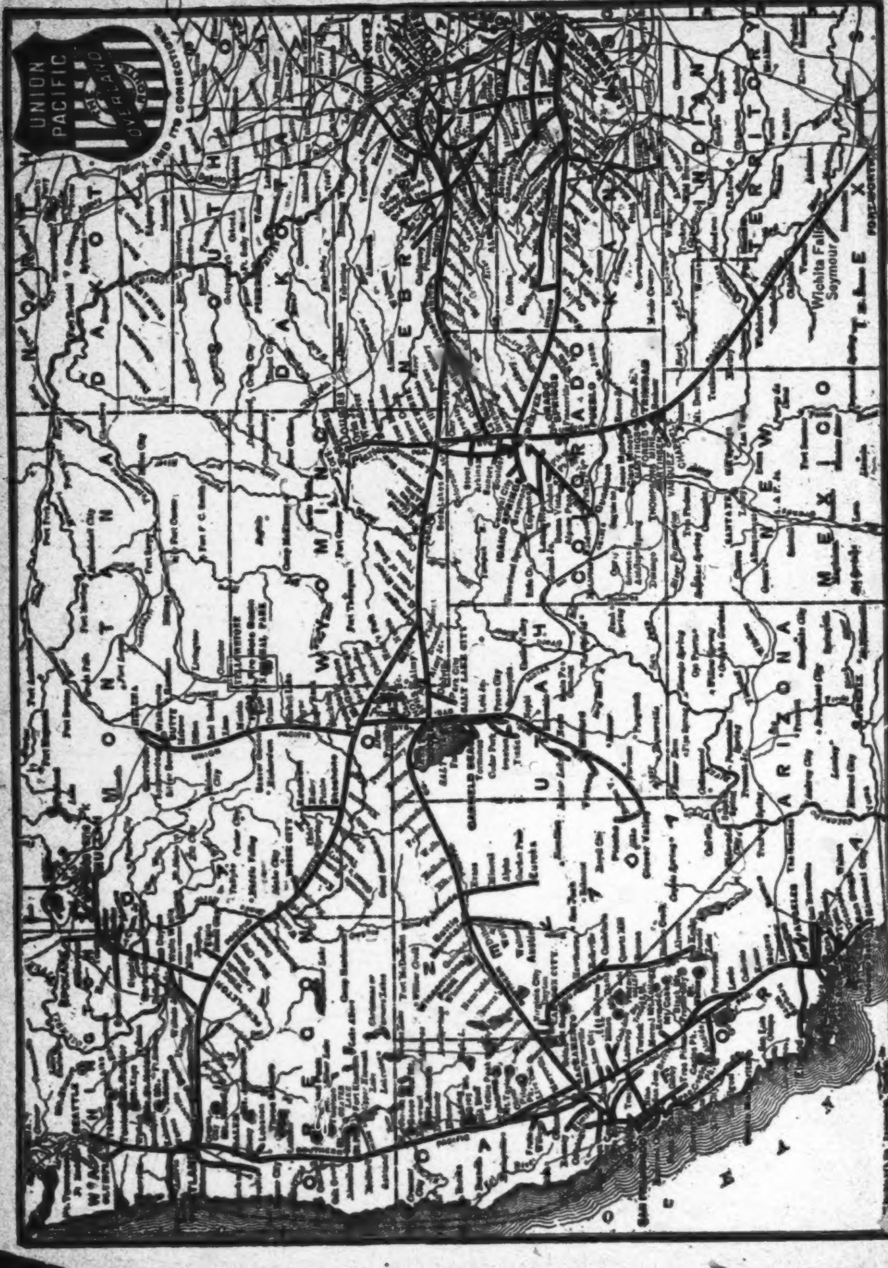
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RESOURCES AND ATTRACTIONS

—OF—

WYOMING

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FACTS ON FARMING, STOCK RAISING, MINING, LUMBERING AND OTHER
INDUSTRIES, AND NOTES ON CLIMATE, SCENERY, GAME, FISH
AND HEALTH AND PLEASURE RESORTS.

WITH THE COMPLIMENTS OF THE

PASSENGER DEPARTMENT.

SECOND EDITION.

ST. LOUIS.
WOODWARD & TIERNAN PRINTING CO., 309-319 NORTH THIRD STREET.
1891.

A COMPLETE AND COMPREHENSIVE DESCRIPTION OF THE AGRICULTURAL, STOCK-RAISING AND MINERAL RESOURCES OF WYOMING; ALSO STATISTICS IN REGARD TO ITS CLIMATE, ETC., COMPILED FROM THE LATEST REPORTS OF 1890.

SECOND EDITION.

OMAHA, MARCH 1, 1891.

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UNION PACIFIC SYSTEM, OMAHA, NEB.

AN OUTLINE.

Wyoming, with its 100,000 square miles of territory, occupies an area as large as the six New England States and Indiana combined.

In point of size Wyoming is the eighth State in the Union.

Sixteen million acres of this State are capable of cultivation.

There are two million head of stock now on the grazing lands of this magnificent domain.

There is abundance of lumber for mining and domestic purposes.

There is coal in every county of the State. An eminent authority estimates the coal area of Wyoming to cover more than 19,000,000 acres; the mines produce at this time about 3,000,000 tons annually.

A vast belt of petroleum covers much of the State.

There are immense deposits of iron; and gold, silver, copper, marble, granite, sandstone, salt, sulphur, gypsum, bismuth, graphite, asbestos, and fire clay are found in various portions of the State.

There are 2,490 miles of mail route, and 900 miles of railway in the State.

The Union Pacific traverses Wyoming its entire length from east to west.

There are nine national and ten private banks. No national bank in the State has ever suspended or gone into liquidation.

The school property of the State cost over $800,000.

Seven cities are provided with water-works and lighted by electricity.

There are five daily and twenty-four weekly newspapers.

Wyoming in 1870 contained 9,118 inhabitants, 20,789 in 1880, and 63,000 in 1890.

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THE STATE OF WYOMING.

LOCATION, AREA, AND PHYSICAL FEATURES.

Wyoming, the youngest of the States, occupies a space between the 27th and 34th meridian of longitude west, and the 41st and 45th degree of north latitude, about 2,000 miles west from the Atlantic Ocean and 800 miles east of the Pacific, forming a parallelogram 365 miles east and west by 275 miles north to south, and containing nearly 100,000 square miles, or an area about as large as the six New England States and Indiana combined. It is bounded by Montana on the north, Dakota and Nebraska on the east, Colorado and Utah on the south, and Utah, Idaho and Montana on the west. The larger part of the present State was acquired by the Louisiana purchase from France in 1803, but a small portion of Southwestern Wyoming was obtained by the relinquishment of Mexico in the treaty of peace signed in 1848.

Under an act of Congress approved July 25, 1868, Wyoming was created from what was then the southwestern portion of Dakota, the northeastern part of Utah, and the eastern part of Idaho.*

The country was then to a great extent unexplored, wild Indians roved over the greater portion of the Territory, and life and property were nowhere secure. There were but a mere handful of white settlers within its borders, probably less than 3,000 actual residents. These had followed the construction of the Union Pacific Railroad, which entered near the southeast corner and traversed westward along the southern part of Wyoming, making possible the organization and settlement of the Territory.

Previous to 1840 very little was known of the country west of the Missouri. The mineral wealth of the country remained undiscovered, and no one had been successful in reclaiming, by cultivation, the land from its desert character. Even as late as 1843, Washington Irving, in the "Adventures of Captain Bonneville," describing the Rocky Mountain region now occupied in part by Wyoming, makes the following prediction of the future of the country and its people:—

"Some new system of things, or rather some new modification, will succeed among the roving people of this vast wilderness; but just as opposite, perhaps, to the inhabitants of civilization. The great Chippewyan chain of mountains and the sandy and volcanic plains which extend on either side are represented as incapable of cultivation. The pasturage which prevails there during a certain portion of the year withers under the aridity of the atmosphere, and leaves nothing but dreary waste. An immense belt of rocky mountains and volcanic plains, several hundred miles in width, must forever remain an irreclaimable wilderness, intervening between the abodes of civilization, and affording a last refuge to the Indian. Here roving tribes of hunters living in tents or lodges, and following the migrations of the game, may lead a life of savage independence, where there is nothing to tempt the cupidity of the white man. The amalgamation of various tribes and of white men of every nation will in time produce hybrid races like the mountain Tartars of Caucasus. Possessed as they are of immense droves of horses, should they continue their present predatory and warlike habits, they may in time become a scourge to the civilized frontiers on either side of the mountains, as they are at present a terror to the traveler and trader."

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*The admission of Wyoming to the Union dates from July 10, 1890.

It is not strange that Irving, with a matchless power of description, should have laid the foundation of an opinion of the utter barrenness of the Rocky Mountain region that it is almost impossible to remove from the minds of those who have not witnessed the marvelous growth of the far West, even to this day. He little dreamed what railroads, the discovery of vast mineral wealth, and the application of modern machinery would do in developing the vast resources of the West. No more can we, comparing the past with the present, comprehend the great destiny that awaits the development of Wyoming within the next fifty years.

As late as 1870, the total population of Wyoming did not exceed ten thousand. The entire northern part of Wyoming was overrun with Indians, and it was not until 1876-77 that General George Crook succeeded in bringing these warlike tribes to peace.

The tribes of Indians then occupying Wyoming were the Sioux, Crows, Arapahoes, Shoshones, and remnants of other tribes. They remained here in greater or less numbers until compelled to go upon reservations elsewhere, the Utes on the south, in Colorado, the Sioux on the western limits of Dakota, the Crows on the southern limits of Montana, and the Shoshones and Arapahoes near the eastern limits of Idaho and a reservation in the Wind River Valley of Wyoming. The early settlement and industrial interests of Wyoming were much retarded through the hostility of these tribes, miners and settlers being driven from their mines and homes. To-day there are no Indians within the limits of Wyoming, except the Arapahoes and the Shoshones. These Indians occupy the Wind River Reservation, covering an area of 1,520,000 acres. They are peaceful, and have made some progress in education and agricultural pursuits.

Wyoming takes its name from the Indian word "Maughwanwame," meaning plains, and first had its application in the Wyoming Valley of Pennsylvania. The general surface of the State is mountainous, with foot-hills, bold bluffs, broad rolling plains or undulating plateaus, with a mean elevation of about 6,000 feet. The average elevation is 1,000 feet less than Colorado. The extremes range from 3,000 to 14,000 feet above the sea level. Numerous rivers and their tributaries flow throughout the State, while the sublimity and grandeur of scenery is unsurpassed by any part of the globe. The principal ranges of mountains in Wyoming are the Wind River in the northwest, the Big Horn north of the center, the Black Hills in the northeast, the Laramie range south of the center, and the

Rattlesnake and Sweetwater in the central portion of the State. Several of the great rivers of the continent, including the Missouri, the Colorado, and the Columbia, have their headquarters in Wyoming. The Yellowstone and its tributaries, the Big Horn, Powder, Little Missouri, and Cheyenne, on the north, flow from the northern part of the State and empty into the Missouri; the Green River and its tributaries traverse the southwest, flowing into the Colorado; the Snake River is the chief tributary of the Columbia in the west, and the north fork of the Platte with its many tributaries flows through the center and southeastern portion of Wyoming. None of the rivers of the State are navigable, but they are the natural avenues for railroads, and along their banks will be located the future cities and towns of the commonwealth. The rich mineral treasures of the mountains will be poured into the valleys and plains, which in turn will supply the agricultural and stock-raising products.

Wyoming has a total area of 62,645,120 acres, of which the greater portion is adapted to grazing and agriculture; of this nearly 48,000,000 acres have been surveyed. It is estimated that between 12,000,000 and 15,000,000 acres can be successfully cultivated, and that nearly 10,000,000 acres are covered with timber. The soil is generally a rich sandy loam, and where it is irrigated below 7,500 feet produces abundantly all the cereals, vegetables, and fruits common to the Northwestern States. Farming is not yet carried on in very many places, the chief industry being stock-raising. A marked change, however, is rapidly taking place in the combination of pastoral and agricultural pursuits. The stock-raising industry comprises nearly one-half the total wealth of the State, but five years ago this industry represented more than three-fourths the entire valuation of property. Other industries have increased faster than live-stock raising, and the extension of railroads will give greater prominence to other interests.

The geological surveys of Wyoming demonstrate that the outcropping and underlying material forming its physical structure is greatly varied in character, nearly all the precious, superior, and baser metals being found in large quantities. With the exception of coal, the output of which in 1889 exceeded $5,000,000, the mineral wealth of Wyoming can hardly be said to be developed. Coal is found in every county of the State in inexhaustible quantities, and extensive basins of petroleum are known to exist in northeastern, central, and southwestern Wyoming. There are also mountains of valuable iron ore, vast deposits of gypsum, soda, salt, sulphur, copper, lead, tin, mica, and other minerals; also marble, granite, sandstone, mineral paint, kaolin, fire-clay, graphite, cinnabar and magnesium. Gold and silver-bearing ore has been found and profitably worked in numerous localities. Much of this wealth is remote from railroads and only awaits the advent of the iron horse before inviting capital for investment. The climate is healthful, and has been pronounced by high authority as the most salubrious of North America.

PHYSICAL AND SCENIC FEATURES.

The physical and scenic features of Wyoming are remarkable for their variety and grandeur. The State is, in the main, broken in its general surface features, here and there rising from undulating plains to lofty mountains. Illustrating this, the great plains of Nebraska extend into Eastern Wyoming from 40 to 70 miles, when they gradually rise to an elevation of from 6,000 to 9,000 feet above sea level, thus forming the Laramie or Black Hills Range, a part of the eastern spur of the Rocky Mountain system which extends from the British possessions through Western Montana into Wyoming from its northwest corner to the southeast, into Colorado, and southward across the continent.

To give a methodical and comprehensive survey of the surface features of Wyoming at a glance, we will traverse from east to west the southern half, or that portion of it lying south of the North Platte and Sweetwater Rivers and the Wind River Mountains to the Snake River, where it crosses the State line into Idaho, and from thence returning in a survey of the northern half, or that portion of the State lying north of the lower Snake Valley, the Wind River Mountains, the Sweetwater and North Platte Rivers, to the eastern limits.

MOUNTAIN RANGES.

The Laramie Range, the most eastern of the Rocky Mountain system, extends from the south line of the State, some 70 miles from the eastern limit, northward to the North Platte River; thence, bearing westward with the river to the angle thereof in its course from the south, it is from 15 to 40 miles in width, about 175 miles in length, north and south, has a mean elevation of some 8,242 feet, while Laramie Peak reaches an altitude of 11,000 feet.

West of this range are the Laramie Plains, a tract of rich grazing and agricultural lands some 70 miles wide by 130 miles long northwest and southeast, extending to the North Platte River on the west, broken on the south by the Snow range of Medicine Bow Mountains, which jut into the State some 50 miles from the Colorado Range in a northwest direction along the east side of the Platte River, having a width from 20 to 30 miles and an elevation of some 10,000 feet. Skirting the west side of the North Platte Valley, distant about 15 miles from that river, rise the Sierra Madre Mountains, extending from the Colorado line parallel with the river some 35 miles northwestward, with a breadth of perhaps 15 miles.

North of this latter range, and bordering on the south side of Sweetwater River, is the Sweetwater range of mountains, from the Platte River near where the Sweetwater forms a junction with it, extending westward some 120 miles, when they join the Wind River Range, extending northwestward. The Sweetwater Range is from 12 to 30 miles wide.

The country extending from the Platte River to the Green River, a distance of about 150 miles west, and between the Sweetwater Mountains and the southern limit of the State, a distance of about 90 miles north and south, and along the Green River some 60 miles still farther northwestward to the source of the latter river and to within 70 miles of the Yellowstone Park, is a vast plain, the eastern portion of which is sometimes designated as the "Red Desert," and the northwest portion, the "Colorado Desert," or

Green River Basin. This vast extent of Southern Wyoming thus outlined, presents an undulating surface, broken here and there into hills, sand-dunes and buttes. West of the Green River Valley rise the Bear River, Salt River, and Wyoming Mountains, extending along the western border of Wyoming northward for about 150 miles to the Snake River Valley, about midway of the State north and south.

Now, returning eastward in the survey of the northern half of Wyoming (that portion thereof lying north of the lower valley of Snake River, of the north end of Green River Valley, and of the Sweetwater and North Platte River), we first find the Teton range of mountains, which extends along the western limit of the State from the lower valley of Snake River where it crosses into Idaho northward into the Yellowstone National Park, and is there joined by the Yellowstone Range, extending along the Western limit of the valley of the Yellowstone River to the Montana line. Crossing the Yellowstone Valley eastward, the Shoshone range of mountains stands before us, extending from the north line of the State southeastward between the Yellowstone and Big Horn valleys for about 85 miles. This range is from 30 to 60 miles in width, with a general elevation of from 10,000 to 11,000 feet. Southeast of the Togwotee Pass—which is formed by the Buffalo Fork of the Snake River in its course from the east—rises the Wind River Range, which is from 25 to 40 miles wide, with an altitude of from 10,000 to 12,000 feet above the sea, and snow-capped the year through; it extends southward about 100 miles to the western limit of the Rattlesnake Range on the north side of the Sweetwater River. Between this mountain range and the Big Horn River is a wide area of plains extending north and south between the north line of the State and the Owl Creek Mountains, a distance of about 90 miles in length and a mean distance of about 50 miles in width. South of the Owl Creek Mountains (a spur of the Shoshone Range, from 15 to 30 miles in width and about 50 miles in length, extending to the Big Horn River) is another vast plain, the valley of Wind River and its tributaries, extending southward from Owl Creek Mountains to the Rattlesnake Range, a distance of some 60 miles, and extending eastward from the eastern base of Wind River Mountains to the southern extension of the Big Horn Mountains, a distance of about 100 miles. The entire area of plains thus outlined is an excellent grazing region, and much of it is available for agricultural purposes, especially the Shoshone Indian Reservation, which lies at the eastern base of the Wind River Mountains, averaging about 55 miles square, and containing an area of over 1,500,000 acres. This reservation is well watered by the Wind River and its tributaries, and would be a valuable acquisition to the agricultural domain of the State.

The Rattlesnake Mountains form a range extending from the termination of the Wind River Mountains (about 150 miles east of the western limit of the State), along the north side of Sweetwater River to near its junction with the North Platte, a distance of about 75 miles. The range forms the divide or water-shed of the Rocky Mountain chain in its course through Wyoming, which is more or less broken by minor water-courses cutting it here and there. The width of the Rattlesnake Range is from 15 to 25 miles.

East of the Big Horn River rises the Big Horn Mountain range, which extends from Montana southward, forming the eastern limit of the valley of that river. The length of this range from the northern line of the State southward to the Rattlesnake Mountains is about 150 miles; its width where it enters Wyoming is about 50 miles, growing narrower in its course southward until it is only about 3 to 10 miles wide at its southern limit near the Rattlesnake Range. The general elevation of the Big Horn Range is from 8,000 to 12,000 feet.

Between the Big Horn River and the western base of the Big Horn Mountains is a tract of country or valley plains extending from Shell Creek—a small tributary of the Big Horn rising some 45 miles eastward in the range, and joining the main river about 25 miles east of the northern State line—to the Rattlesnake Mountains, a distance of 125 miles southward, the northern portion of which is more or less broken.

From the Big Horn Mountains to the east line of the State, and from its northern limit to the Platte River, is a vast tract of country about 150 miles east and west and about 170 miles north and south, within which is the county of Crook, nearly the east half of Johnson, the northern one-third of Carbon and Albany counties, and the northern half of Laramie county, the largest and best agricultural and grazing portion of the State. The eastern part of Crook county is somewhat broken by projections of the "Black Hills of Dakota" from the Dakota side for some 10 to 15 miles, and along the State limit some 20 miles, with a spur, the Bear Lodge, on the northwest extending to the Belle Fourche River. However, these elevations can hardly be classed as mountains—no more than a broken chain of hills, similar to those which extend from the northern limit of the Laramie Range up the east side of the Powder River for some 80 miles, and which are not more than from 1 to 12 miles in width. The valleys of the Powder, Belle Fourche and Cheyenne Rivers and their numerous tributaries, not only afford water-courses for this rich country, but also cause, to quite an extent, its broken features.

Viewing the general distribution of the mountain ranges of Wyoming as a whole, it will be found that they are divided into four general chains, as follows:

The first is the western portion of the Black-Hills, which extends across the Dakota line into Wyoming, some 15 or 20 miles in the northeast part thereof, being the continuation of the Powder River chain lying on the north in Montana, with the Bear Lodge Mountains and other lesser elevations lying northeastward some 15 miles. This chain is comparatively insignificant.

The second chain is made up of the Big Horn Range, which rises on the east side of the Big Horn River in Montana, and extends southward into the east and west center of Wyoming to near the northern limits of the Laramie Range, which joins the general Rocky Mountain chain near the southern line of the State.

The third chain comprehends the main ranges of the general Rocky Mountain chain, extending from the northwest corner to the southeast part of the State, and is formed by the Yellowstone, Shoshone, Wind River, Rattlesnake, Sweetwater and Medicine Bow ranges, the latter of which crosses into Colorado.

The fourth and last chain lies on the western limit of the State, and is composed of the Washburn Range, in the northwest corner of the Yellowstone National Park southward to the Madison River; of the Teton Range, from the latter river to the lower Wyoming limit of the Snake River; of the Salt River, Wyoming and Bear River ranges to the southern line of the State, where they join the Uinta Mountains in Utah. This latter chain is collateral to the general Rocky Mountain chain. Between these several mountain chains intervenes the vast extent of undulating plains from which the ranges rise irregularly and often abruptly, and from which the main water-courses find their source.

WATER-COURSES.

Having thus given a general outline of Wyoming's mountain ranges and their features, the water-courses thereof have much to do in the formation of its surface character, and are important, not only in relation to the drainage system of the State, but for economic purposes in its industrial resources as well.

An examination of the field notes of the surveyor-general's office of this State will, beyond question, show Wyoming to contain the most extensive and complete natural system of water-courses and drainage of any portion of the domain of the continent. Having a general elevation above the sea of about 6,000 feet, and its limits being crossed by the great chain of the Rocky Mountains from the northward to the southward, with their lateral ranges and mountain spurs extending at intervals in various directions, it constitutes a part of the great continental divide, thus creating a water line and making the altitude of the Atlantic and Pacific slopes the dividing source of the various water-courses, sending those rising on the eastward to the Atlantic Ocean, and those rising on the westward to the Pacific.

In tracing the water-courses and drainage system of Wyoming, we will note them as they appear in a general survey of the State from east to west.

The largest and most important water-course in the State is the North Platte River, which has its source in the North Park of Colorado, and enters the southern limit of Wyoming 120 miles west of the east line, and, circling toward the west around the base of Medicine Bow Mountains, courses northward 125 miles, when it bears eastward around the northern limit of the Laramie Range to Fort Fetterman, thence southeastward, crossing into Nebraska about 70 miles north of the south line of this State. Its linear length in Wyoming is some 300 miles, and its average width is about 55 yards, being about 75 yards at Fort Laramie and about 35 at Fort Steele, where it is crossed by the Union Pacific Railroad. Among the larger tributaries of the Platte are the Big and Little Laramie and Sweetwater Rivers. The Big Laramie also rises in the North Park of Colorado. Crossing into Wyoming 8 or 10 miles east of the North Platte, it courses in a northeast direction past Laramie City, thence northward along the western base of the Laramie Mountains for some 65 miles, when it bears northeastward through the Laramie Range to Fort Laramie, where it joins the North Platte. The Little Laramie and North Laramie are both tributaries of the Big Laramie. The latter rises near the western base of Laramie Peak, some 75 miles west of the Nebraska line, and, crossing through the Laramie Range, joins the Big Laramie near its eastern base. The length of the main Laramie in Wyoming is about 135 miles. Besides this tributary of the North Platte on the south, and flowing from the eastern slope of the Laramie Range, are the Chugwater, Horse Creek, Lodge Pole Creek, and Crow Creek, the Medicine Bow River flowing from the west slope of the same range. The principal tributary of the North Platte from the west is the Sweetwater River, which rises on the slope of the southern end of the Wind River Mountain range, and courses eastward between the Sweetwater range of hills on the south and Rattlesnake range of mountains on the north, to its junction with the North Platte, a distance of perhaps 115 miles.

The northeast portion of the State lying north of the Platte and east of the Big Horn Mountains is watered by the Cheyenne River, which rises about 100 miles westward of the point where it crosses into Dakota at the northwestern corner of Laramie County. It has numerous tributaries feeding it on either side from its source to its Eastern Wyoming limit. North of the Cheyenne we meet the Belle Fourche River, which rises in the Powder River Hills, near the southwestern corner of Crook County, and courses northeastward a distance of about 120 miles, when it crosses into Dakota north of the Black Hills. This river is also augmented by many tributaries on either side. This water-course, with the east branch of the Powder River (which has its source in the central portion of Crook County and passes out on the north), and some 40 miles of the headwaters of the Little Missouri River, with their numerous affluents, comprise the water-courses of Crook County in the northeastern corner of the State.

West of the Little Powder River we next come to the main Powder River, which has its source on the northern slope of the eastern limit of the Rattlesnake Mountain range, and courses northward along near the line dividing Crook and Johnson Counties into Montana, flowing a distance of some 170 miles in Wyoming. The Powder has a number of extensive tributaries, including Clear Creek, Crazy Woman's Fork, and North Powder River, all rising on the eastern slope of the Big Horn Mountains, with Sand and Salt Creeks as southeastern affluents. Tongue River, a beautiful, pure, fresh-water stream filled with trout, rises in the eastern slope of the Big Horn Mountains within 30 miles of the north boundary of Wyoming, and flows northeasterly into Montana and on to the Yellowstone River. Its length in Wyoming is about 50 miles. Its tributaries in this State—Wolf, Big and Little Goose, and Prairie Dog Creeks—are all beautiful streams, and are largely utilized for irrigation and farming, that part of Wyoming being a very productive agricultural country wherever irrigated. These rivers and their tributaries water an area extending from the Big Horn Mountains through Johnson and Crook Counties to the eastern limit of the State, thus making it one of the grandest sections of the State for grazing and agricultural purposes.

West of the Big Horn Mountains, and forming the western line of Johnson County and the eastern line of Fremont County, flows the Big Horn River, which is formed about ten miles from the southeast corner of the Shoshone Indian Reservation, and near the base of the southeastern limit of the Wind River Mountain range, by the junction of the Wind, Little Wind and Popo-agie Rivers, and Beaver Creek and several other affluents, and thence courses almost due north a distance of 140 miles, when it passes into Montana and soon joins the Yellowstone. The Big Horn is a fine river of excellent water, and with its tributaries—Bad Water, No Wood and Shell Creeks on the east (finding their source on the western slope of the Big Horn Mountains), the Muddy (which flows from and along the southern base of Owl Creek Mountains), Owl (which flows from and along the northern base of the same mountains), and Gooseberry Creeks, and the Gray Bull and Stinking Water Rivers, rising in and flowing from the Shoshone Range on the west—affords ample water supply and complete drainage to the Big Horn Valley, an excellent area of agricultural and grazing land, being an open undulating region. The altitude of the Big Horn River at its source is 7,500 feet; at the north line of Wyoming, it is 3,500 feet above sea level.

Wind River, the next water-course we approach, is northwest of the Big Horn. It rises in and at the upper extremity of the Wind River Mountains near Togowotee Pass and the water line of the continental divide, and courses southeastward through the Shoshone Indian Reservation to its junction with and formation of the Big Horn River—a distance, in a direct line, of about 100 miles—to near the southeastern limit of the Wind River range of hills. It is joined in its course by Torrey's Fork and Beaver Creek on the northeast side, and by Bull Lake Fork and other smaller affluents on the southwest side. This river and its tributaries extensively water and drain the Shoshone Indian Reservation, the best agricultural and grazing section of the western part of the State.

South of the source of Wind River and on the southwestern slope of the northwestern limit of the Wind River Mountain range, rises Green River, which flows nearly southward to the southern limit of the State, thence to its junction with the Colorado River. Its length, in a direct course in Wyoming, is about 165 miles; its altitude at old Fort Bonneville, at the mouth of Lead Creek, some 18 miles from its source, is 7,400 feet above the sea level; at Green River City, on the Union Pacific road, 6,130 feet. Its tributaries are Lead, Horse, Marsh, White Clay, Bitter Root, Piney, Feather, La Barge and Slate Creeks, and Ham's, Big and Little Muddy, and Black's Fork Rivers (rising in and flowing from the Salt and Bear River ranges on the west), and Fremont's and New Fork Creeks, Big and Little Sandy Rivers (rising in and flowing from the Wind River Mountains on the northeast), and Bitter Creek, rising about 60 miles east and coursing along the line of the Union Pacific Railroad to Green River City, where it joins the Green River. This river is the second in length in the State. It has a deep channel and a rapid current of good clear water, and, with its tributaries, furnishes a water supply and drainage for nearly one-eighth of the State, though much of the region thus watered is mainly available for grazing purposes only. The only tributary of Green River which is impregnated to any great extent with alkali is Bitter Creek. The valley or basin plains of Green River slope with the general trend of the Rocky Mountain chain: hence its drainage is ample.

On the western limit, between Wyoming and Idaho, courses Bear River, which has its source in the Uinta Mountains in Utah. Coursing northward, it crosses the south line of Wyoming within 6 or eight miles of its southwest corner; it flows northward some 40 miles, when it leaves Wyoming, passing into Idaho northwestward some 40 miles, when it curves sharply to the southwest and empties into Salt Lake. Bridger and Twin creeks, Smith's Fork, which flows from the southern base of Wyoming Mountain southward, and other minor tributaries, join the Bear from its Wyoming side.

Passing northward, we next come to the Snake River where it passes into Idaho. This river has its source a few miles north of Shoshone Lake, in the southern part of Yellowstone National Park, and flows south through Jackson's Lake, some 15 miles from the Park, where it sweeps eastward along the southwestern base of the Shoshone Range, thence, meandering to the southern base of the Teton Range, where it passes into Idaho, and thence on northwestward to the Columbia River. The length of the Snake, in Wyoming, is about 100 miles in a direct course, and with its tributaries—Buffalo Fork, Gros Ventre, and Hoback's rivers from the eastward, and John Davis and Salt rivers from the south—abundantly waters and drains Snake River Valley, which is from 10 to 20 miles wide, and may be regarded as a continuation northward of the Green River Valley hemmed on either side by high ranges.

The altitude of Snake River at its source is 8,000 feet above sea level; at Shoshone Lake, 7,870 feet; at Jackson's Lake, 6,806 feet, and at the junction of Salt River, 5,742.

The last, though not least, of the larger and most important water-courses of Wyoming is the Yellowstone River, which has its source on the continental divide of the main Rocky Mountain chain, and flows therefrom some 25 miles northwest, to the southeast corner of the Yellowstone National Park, thence in the same direction to Yellowstone Lake, a distance of 15 miles. From this lake the river runs north and northwest to the Montana line, whence it wends its way northeastward and joins the Upper Missouri. The length of the Yellowstone in Wyoming is about 85 miles, and its altitude at its source is 8,385 feet above the sea; at Yellowstone Lake, 7,393 feet, and at the point where it leaves the Park on the north, 5,369 feet. Thus it will be seen that the descent of the Yellowstone River, from its source until it leaves Wyoming, is 3,016 feet. The tributaries of the Yellowstone are Tower Creek, flowing from the Shoshone Mountain range on the east along near the northern boundary of the State and Gardiner's River, flowing in from the west. Madison River is a small water-course, having its source in Madison Lake in the southwestern part of the Park, and flowing northwestward into Idaho.

Thus it will be observed that nature, in its physical economy, has made a generous distribution of natural water-courses over the State, which is important to its industrial interests. A peculiar and interesting feature of this distributing system is the fact that many of its most important streams (as a glance at a Wyoming map will show) find their source within a radius of 10 miles of each other on the continental divide, near the southeast corner of the National Park. Of these, the Yellowstone, Wind, and Big Horn flow from the Atlantic slope, and the Snake and Green from the Pacific side.

WYOMING LAKES.

While Wyoming has no large lakes, it has numerous small ones lying among the mountain ranges of the western part of the State. As the drainage of this and other sections of the continent is geologically known to have begun a long period before the water-courses were formed, it is concluded that it was accomplished by the general elevation of the country through its gradual incline to the southward, thus sending the waters which then covered the country to the Atlantic and Pacific. As the waters gradually subsided, they were drained into depressions which formed lakes of greater or less dimensions, serving as reservoirs. Then began the excavation of water-courses, made by the overflow of these reservoirs—above and below the surface seeking an outlet—and the erosive action of the glacial period.

The largest lake in Wyoming is Yellowstone. It is about 22 miles long from south to north, and from 10 to 15 miles wide from east to west, and has been sounded at the depth of 300 feet. It is a beautiful expanse of water, cold, clear, and filled with vegetable growths, and abounding with salmon trout.

Upon the divides on either side of Yellowstone Lake are numerous small lakes at an elevation of 10,000 to 11,000 feet above sea level, many of which have no outlet, being merely reservoirs for the elevated plateaus. To the southwest of Yellowstone Lake are three lesser lakes—Shoshone, Lewis, and Madison—besides other small ones. The former is the largest, being about 5 miles long and 3 miles wide, and has an altitude of 8,000 feet above the sea. Lewis Lake, some 5 miles south of Shoshone, is a clear body of water some 2½ miles long by 1½ miles wide. Four or 5 miles west of the west branch of Shoshone is Madison Lake, a beautiful body, skirted with a dense pine forest. It is about 3 miles long north and south, and 2 miles wide east and west. Some 10 miles south of Yellowstone Lake lies Heart Lake, which is one of the sources of Snake River, and nearly as large as Lewis Lake. Besides these there are other lesser bodies, lakelets, nestling on the mountain plateaus and in the lower valleys, which are interesting attractions to the Park region.

Descending into Snake River Valley we find, some 40 miles from its source, Jackson's Lake, an irregular body some 8 miles in length, and from 2 to 3 in width, with a sounding of 250 feet in depth, and with a good sized island. Just below Jackson's Lake are two other lakes, Leigh's and Jenney's, about a mile apart, and which are some 2 miles long by half a mile wide each. Still farther south down this valley are two more interesting lakes, called Taggart and Phelps, which are more or less surrounded by moraines or glacial walls from 150 to 420 feet above the lakes.

The most wonderful feature of the lake system of Wyoming is that mentioned by Gov. N. P. Langford, a former superintendent of the Yellowstone Park, in his report to Dr. Hayden, United States Geologist, in 1872. He says:—

"On our descent of Teton Mountain, while yet at a height of 10,300 feet, we crossed a lake 600 yards long by 200 wide, of perpetual ice, which in thickness was about 3 feet, not unlike in character the descriptions given of the most elevated glaciers of the Alps."

This might be called the "Hidden Lake."

Passing southward into the Green River Valley, we find Fremont's Lake, a body some 8 to 10 miles long and some 2½ miles wide, lying about 12 miles from Fremont's Peak in the Wind River Range. Still farther to the southwest, on the plateau of the Bear River Range, near the source of Salt River, lies a beautiful emerald lake, called Alice. There are hundreds of other lesser lakes scattered over the entire area of Wyoming that are useful and beautiful, but too numerous to mention. These beautiful and interesting little reservoirs of the drainage system of Wyoming are, to a greater or less extent, scattered all through the mountain ranges and plains of the State.

SCENIC FEATURES.

Switzerland has its Alpine mountain ranges and their accompanying features of nature, which command the admiration and wonder of tourists from all lands. So, too, has Wyoming its "Alpine" ranges in the Rocky Mountain chain, which, with its collateral off-shoots and spurs, rises in lofty grandeur throughout its domain. Its snow-capped peaks, its valleys, basins, and plains are marked with many wonderful curiosities, wrought by the steady, quiet hand of Nature through the various elements at her command, which tell us of the long ages of the past. The wonderful power of these elements—atmosphere, heat, and water—in their various relations, is here demonstrated in the upheavals, the depressions, the deep, rock-cut cañons, awe-inspiring cataracts and beautiful cascades, fantastic rocky monuments carved from mountain ranges by the erosive and glacial action of ages past. Mounds, buttes, and dunes rise with artistic symmetry, as though thoughtful skill had formed them rather than the action of the drift. These, with the water-courses that flow from mountain ranges down through deep valleys and cañons, falling over rocky ledges for hundreds of feet, across grass-covered plains, and with numerous lakes embosomed on the high plateaus, slopes, and bases of these ranges, present scenic views doubtless more grand and more wonderful than any other region of country on the globe.

Of mountain peaks there are but few on the North and South American continents of greater elevation than Fremont's Peak, of the Wind River Range—13,790 feet above the sea; in fact, there are but few on the globe higher. Among the higher peaks of the several mountain ranges of the

State are Wind River Peak, 13,400 feet; Grand Teton Peak, of the Teton Range, 13,690 feet; Mount Sheridan, 13,691, and Mount Washburn, 10,316 feet, of the Yellowstone Range; Index Peak, Shoshone Range, 11,500 feet; Wyoming Peak, of Wyoming Range, 11,490 feet; Gros Ventre Peak, 11,570 feet, and Atlantic Peak, 12,700, both of Wind River Range; Yont's Peak, Shoshone Range, 11,700 feet; Soda Peak, 9,683; Whisky Peak, 9,273: Semenoe Peak, 9,930 feet, of the Rattlesnake Range; Washakie Needles, Owl Creek Range, 12,253; Black Butte, Laramie Range, 11,000 feet.

Besides these interesting scenic features of Wyoming, it has numerous soda lakes at the base of the Rattlesnake range of mountains, chalk mountains, painted rocks, and various other natural features which are objects of general interest.

There is no locality known on the globe where there culminates such a grand display of natural scenic wonders as in the Yellowstone National Park—its mountains, valleys, rivers, lakes, cañons, geysers, and other interesting objects, which are more fully noted under the head of the "Yellowstone National Park."

GEOLOGICAL FORMATIONS.

The geological surveys of Wyoming have demonstrated that the underlying and outcropping material which forms its physical structure is varied to a large extent in its character. The science which investigates the material masses of this physical structure is not only interesting but valuable in determining its formation, nature, extent, its economic qualities—whether of mineral or vegetable production—and the causes of these great upheavals of the earth's crust, which we find so prominent within the limits of this State.

Following the course of geological investigations thus far made from east to west, it is found that the various physical formations of Wyoming are—avoiding technical terms as much as possible—composed of different species of sand, clay, marl, rocks, fossils, etc., all indicating the geological ages and periods in which they were formed.

From the best information at hand,—that of Dr. Hayden, United States geologist, and later, of Professor Aughey, State geologist,—it is ascertained that the rocky formation east of the Laramie range of mountains is of modern age, belonging mainly to the tertiary or upper of the third of the rock strata here found; and its exposure along the little water-courses shows gravel and bowlders resting here and there upon hardened deposits of sands, marls, and clays of the lake sediment species. There also appear strata of hardened sandstone. Approaching the base of the mountain range, more or less feldspathic gneiss is found. From Cheyenne to Fort Fetterman, the surface of the country is undulating, of rounded hills, ridges, and valleys, with similar underlying formations as noted about the former place. Along some of the small water-courses northward are found abundant formations of limestone of the carboniferous or coal formation period, which are full of fossils of the genus of stone lilies. These are some of the evidences that the region east of the Laramie and Black Hills ranges was, during the upper tertiary period, a fresh-water lake, of which this range was the western rim. These various slight deposits seem to indicate that they were carried, through forces acting from the mountains, to the plains below, and their contrariety is produced by these forces sweeping down the mountain declivities over the upturned ledges of the various rocky strata, taking portions of the different geological formations and scattering them over the plains. Whatever species of rocks are thus deposited to any considerable extent, the drift carried to the plains is of like character. When the red sandstone rocks predominate, the drift is also more or less red. This is also true of the carboniferous limestone or other strata.

Passing northward beyond Fort Fetterman to the north line of the State, there appears to be no very material difference in the geological formations. The general surface of the country between the Black Hills on the east and the Big Horn Range on the west is of about the same general character as that noted on the south. While in earlier periods it doubtless contained mountain ranges, succeeding periods of geological time have, through steady and continual erosive action, worn them away to moderate hills which bear vegetation upon their slopes and summits. Besides, this vast extent of country now presents high buttes and moderate sand-dunes and ridges, which this erosive process has left to bear evidence of the power and work of the elements and tell the story of the waters of past ages which washed the base of the mountains of to-day. Rawhide Buttes, some 25 miles north of Fort Laramie, belong to a group of high hills which expose strata of carboniferous limestone rocks or gneissic and occasional outcroppings of reddish feldspathic granites. These buttes rise some 700 feet high, and send out several streams, of which Rawhide Creek is the largest. It is supposed that these isolated buttes and mountains were islands in the great fresh-water lake which no doubt existed during the tertiary period.

Passing westward over the Laramie and Big Horn ranges, a variety of geological formations are found which are both interesting and important.

On the eastern slope of the Laramie Range, the tertiary formations disappear, and the carboniferous limestone appears, resting on granite formations. All along this range northward, carboniferous limestone, triassic red sandstone, jurassic limestone, and cretaceous chalk formations crop out. Where these are overlaid with the modern tertiary formations, lignite (a mineral coal) appears. Following the line of the Union Pacific Railroad up over the Laramie Range, we ascend from an elevation of 6,072 feet, at Cheyenne, to that of 8,242 feet at the summit near Sherman, a difference in ascent of 2,170 feet in a distance of 32 miles. The range north and south is furrowed more or less with upheaved ridges which present brick-red colored sandstones, giving a marked appearance to the scenery. The more recent formations rest on strata of almost inexhaustible white limestone, which is valuable to the State as an economic material. Besides this, there is an abundance of other rock material for building and other purposes. On each side of this range are massive elevations of syenite, which, in the distance, look like castles of old. This granite is feldspathic and is susceptible of fine polish, and, in the most part, composes the formation of the range with gneissic strata surrounding it.

Crossing the Laramie Plains, the Medicine Bow Mountains show similar rock formations as the Laramie—the triassic or red sandstone, and the jurassic and cretaceous limestone. Generally along the Medicine Bow northward, including the Rattlesnake and Big Horn ranges, the granite and cretaceous formations predominate, with more or less of triassic red sandstone croppings. The upheavals of these ranges are remarkable, showing great disturbance of the earth's crust during the ages of its formation. Then, too, the general surface has been and is constantly undergoing changes in its physical features through erosion and the drift, the former to the exposure of silurian rocks. It is singularly unusual to find rocks older than the jurassic south of the Sweetwater River.

From the Medicine Bow and Sierra Madre ranges northward to the Sweetwater Hills and Rattlesnake Mountains, siliceous rock formations appear, which furnish fine building material extensively used by the railroad people and others. Above these extensive and thick strata appears blue limestone in abundance; and still above this are found red sandstone formations of the cretaceous class. The eastern part of the Sweetwater Range comprises steep granite hills covered to a greater or less extent with sedimentary strata of the carboniferous age. Erosion has, along this range, worked great changes in them, as well as in the valleys through them. The region south of the Sweetwater Range on the western limit of the State is largely composed of fresh water or marine tertiary beds including "Red Desert," with numerous fresh-water lakes filled with fresh-water shells. Table Rock, in "Red Desert," is a square butte, rising 400 feet above the level of the Union Pacific Railroad, near which it stands, and is conglomerated from the beds of a sandstone largely of fresh-water shells.

Along Bitter Creek westward similar formations of the marine tertiary appear, underlying which are extensive coal measures of Southern Wyoming. Next below the coal measures are found thick strata of yellow sandstone, inlaid with iron indications, and which, in places, rise to nearly perpendicular bluffs, and, through erosive action, they present all kinds of curious and fantastic formations, which have attracted the admiration of tourists and citizens. In the strata of this extensive sandstone formation are found preserved large quantities of deciduous leaves, the ash, elm, maple, poplar, etc., besides other flora fossils, including a species of palm, of the fan-leaf order, which sometimes reaches a spread of 10 feet. This species of flora fossil, thus preserved in the rocks of Wyoming, is proof that its ancient or lower formation forests were far different in specie than those of to-day. There are also, immediately over some of these coal measures, strata of oyster shells several inches thick (about the size of our common edible ones), which mark the silurian or age of mollusks. Along this same range of hills are found extensive tabular strata of hard rock excellent for flagging purposes. Many of these show traces of waves and ripples made by water, and again we find impressions resembling mule tracks on the soft ground before it was formed into rock; also beds of petrified fish, evidence perhaps of the northern limit of the ocean. Passing into Green River Valley, the shale or slaty formations appear more or less. The rocks in the lower part of this valley are of a dark color, and are more or less impregnated with an oily substance. Besides these petroleum strata, there also appears a chalky or cretaceous limestone Even the limestone strata in and along this valley are blackened by saturation with petroleum. The Green River Valley also shows fossils of fishes in its rocks which seem to belong to the Devonian age; they also show fossil impressions of insects, of water plants, and bird feathers. Beds of cannel coal exist here from 15 to 20 feet thick, which experts say will yield 50 to 60 gallons of oil per ton. At this rate some single beds would yield 20,000,000 barrels of oil, more than the total yield of this country since its first discovery. Stone gems are also found in the Green River Valley, especially moss agates, in great profusion, with opals and quartz.

The vast area of tertiary surface from Rawlins westward to the Bear River Range, including Green River Valley, was doubtless once a great lake with the Uinta Mountains as its southern shore line A distinguished geologist has graphically described it thus: "Looking from the summit of a high ridge on the east, a tract of country containing 500 or 600 square miles is distinctly visible. Over the whole surface is rock,—bare rock, cut into ravines, cañons, gorges, and valleys, in magnificent relief, terrace upon terrace, pyramid beyond pyramid, rising to mountain heights; amphitheaters that would hold a million spectators; walls, pillars, towers, castles everywhere. It looks like some ruined city of the gods, blasted, bare, desolate, but grand 'beyond a mortal's telling.' Originally an elevated country, composed of a number of soft beds of sandstone of varying thickness and softness, underlaid by immense beds of shale, it has been worn down and cut out by rills, creeks, and streams, leaving this strange, weird country to be the wonder of all generations."

The rock formations of Big Horn Mountains and Valley are very similar to those on the east and south toward the Wind River and Rattlesnake Mountain ranges. The older rock formations, the carboniferous, triassic, and jurassic, very generally appear, with less of the cretaceous or newer formations than south of the general Rocky Mountain chain, except perhaps the valley plains, with more or less of the tertiary drift overlying them. In the Wind River Valley the fantastically eroded, friable, gray sandstone buttes cover both slopes of the Wind River and Shoshone ranges. The formations of Snake River Valley are carboniferous limestone on the western slope of the Shoshone Range, as shown in the lower and upper Gros Ventre Buttes, and some formations crop out as low as the lower silurian, which appear along the eastern slope of the Teton Range. The mass of the ranges on either side of this valley are composed mainly of dark gray gneiss rocks and gneissic granite. The hills and low lands of this valley being covered with grass show less exposure of rock formations. Gold is said to exist in the drift of Snake River, Gros Ventre, and other streams of this valley.

THE FLORA OF WYOMING.

The flora of Wyoming is, to a greater or less extent, a test of the fertility of its soil in the production of vegetation. Experiments have shown that wherever there is soil in these mountainous regions, it has the primary elements of productiveness. The extent to which this is productive of vegetation depends, of course, upon the depth of the surface stratum of the mold, of the drift elements which compose it, and of moisture. To the extent these essentials exist, the flora of the State flourishes.

There are within its borders many hundreds of plants indigenous to Wyoming which flourish wherever vegetation is found. Their complete enumeration, by their botanical names, would be too extensive for the limits of this report. The flora of the State comprehends, in addition to the flowering plants, a large variety of grasses (some sixty species), mosses, lichens, and various species of tree flora. While some varieties of the latter—the aspen, box-elder, cottonwood, ash, willow, and buffalo shrub—are found along the various water-courses, the real forests of the State are in the mountain ranges, which mainly consist of the coniferous species—pine, cedar, spruce, hemlock and fir. The pine is generally of the Norway species, hard and white. The thriftiness and density of the coniferous forests vary in different parts of the State and their elevation on the mountain ranges. The Teton, Shoshone, Wind River, Owl Creek, and Big Horn ranges contain the heaviest and thriftiest bodies of timber, while the Sweetwater, Rattlesnake, Medicine Bow, and Laramie ranges are fairly supplied. East of the South Powder are densely wooded tracts

TIMBER.

An interesting feature concerning the growth of timber is the limit of altitude at which it will grow. Measurements of timber limits of various mountains have been made, which show the heights, in their respective latitudes, above which coniferous trees—the hardiest of any species—will not grow. The timber line of Mount Washburn is 9,900 feet above sea level, while the altitude of that mountain is 10,388; the timber line of Mount Hayden, of the Teton Range, is 11,000 feet, while its altitude is 13,858 feet above the sea; the timber line of Wind River Range is 10,160 feet, while its general altitude is 11,500 feet above the sea. The timber lines of other Wyoming mountains are given, but the foregoing suffice to illustrate the elevation at which the hardiest flora will grow.

On the eastern slope of the continental divide the timber grows to a greater height, is straighter and more dense than on the western slope. This is owing, doubtless, to a lower altitude and to stronger vegetation properties. The growth of timber in Wyoming, during its general occupancy by the Indians, was also, to a great extent, retarded by forest fires, which, to a greater or less degree, is the cause of its spareness on the plains, and its comparative small size in general. The fact is, that wherever trees are transplanted in localities along the streams they grow without care or attention; and they will also grow in almost any locality on the plains if water is furnished them through irrigation, and devastating prairie fires are not allowed.

As a whole, the flora of Wyoming, its flowering plants of many genera and over a thousand species, its shrubs and forest trees, will compare favor ably with any region of the mountainous sections of the continent. With the exception of the harder varieties of timber, such as beech, maple, oak, hickory, etc., which do not naturally grow in Wyoming, the indigenous species, because of their hard, tenacious qualities, supply nearly all the demands required for economic uses.

From the most reliable data obtainable, it is estimated that Wyoming contains an area of about 24,000 square miles, or nearly 16,000,000 acres, of forests, distributed over the State as above indicated. Large quantities of the timber of this vast area are suitable for manufacturing purposes.

FAUNA OF WYOMING.

The fauna of Wyoming is extensive in all its genera and species. Probably no State or Territory excels it in this respect. There are about thirty known species of mammals, of which the following are prominent: The blunt-nose and Gale bats; the jumping and the bank mice; the mountain rat; the red, striped, and the lined tail squirrels; weasels; the yellow and the striped skunks; wolverines; the marmot, or woodchuck; the yellow porcupine; the prairie dog; bairds and the jack rabbits, of which the woods and the plains are full. Of the fur-bearing animals are the mink, otter, ermine, and American beaver. Of the animals of prey, are the red, gray, silver-gray, cross, and the swift fox; the gray wolf; coyotes; lynx; badger; wild cat; the black-footed ferret; the mountain lion.

The game animals are the mountain sheep; mountain goat; antelope; elk; the black and the white tailed deer; the moose; the black, cinnamon, brown, and the silver grizzly bears, although the grizzly species is not so numerous as the others named. The buffalo has become nearly extinct, though there are a few in the Yellowstone Park and in some of the more isolated regions of the northwestern portion of the State.

Wyoming in its more primitive days was a paradise for wild animals, which roamed over its domain by thousands, and perhaps millions. But after the advent of the Union Pacific Railway, and the pioneer settler, and merciless hunter and sportsman from the States, and from foreign countries even, their numbers grew less—grew less because of their great slaughter for gain and sport, until to-day many of the larger species are becoming scarce. To check the destruction of the food game of Wyoming, to the unreasonable and merciless extent to which it had been carried for gain and for sport, the Legislature, in 1869, enacted a law for its protection. This was amended in 1875 by a more stringent enactment, "For the protection and to prevent the destruction, of wild game," among other things, limiting the time when it might be killed for food only. In 1882, the Legislature again amended the law with still more stringent provisions and penalties for its violation. This latter enactment is the law of the State, and prohibits the pursuing, hunting, killing or capture by any means, of deer, elk, moose, mountain sheep, mountain goat, antelope, or buffalo between August 1 and October 15 in each year. It also prohibits the killing or destruction, by any means, of any species of game birds, except within the prescribed limits, from spring time until autumn; and quail and some other kindred species are prohibited from being killed except in the month of September. It also prohibits the killing or ensnaring of wild ducks, brant, and geese, between May 15 and August 15 of any year. It is also unlawful to kill any fowl or bird that subsists on insects only as food, during any time of any year. The existing enactment also prohibits the sale or exposure for sale of the carcass, or any part thereof, suitable for food, of any of the species of animals or birds enumerated in the law, save during the time allowed for their killing. It is also unlawful for any person, company, or corporation to purchase or obtain in any manner any green or untanned hides of any of the animals mentioned above; or to transport the same after the passage of the present law, enacted March 9, 1882. The law also provides that no person shall kill more of the game animals thus named than they can use or dispose of for food; except that any citizen of the State may kill any game for his own and family's use for food within 10 miles of the residence of such citizen.

The penalty for the violation of the game law of Wyoming is a fine of $100 for each offense, or imprisonment, or both.

Thus it will be seen that the reckless and inordinate slaughter of the wild game of Wyoming is prohibited by law, accompanied with stringent penalties, which the executive authorities are bound to enforce.

CLIMATOLOGY AND HEALTH.

Wyoming has superior climatic advantages. Remote from the sea-coast and large bodies of water, there is but little fog or rain, and the general prevalence of sunshine renders the atmosphere dry, rare, and clear. Cloudy days are the exception. Objects are seen at great distances, and the atmospheric influence on the human system is bracing and healthful. The following tables illustrate Wyoming's climatic conditions as compared with other localities:—

STATIONS.	Elevation.	Mean.				Atmosphere—1886.		
		Barometer (ten years).	Relative humidity (four years).	Precipitation (ten years).	Temperature (ten years).	Clear.	Fair.	Cloudy.
	Feet.	*Deg.*	*Deg.*	*Inches.*	*Deg.*	*Days.*	*Days.*	*Days.*
Augusta, Ga	183	30.140	69.2	48.96	640.2	130	158	79
Jacksonville, Fla	43	30.030	69.0	55.94	690.2	102	176	87
Boston, Mass	142	29.840	66.5	49.47	480.5	131	145	88
Newport, R. I	34	29.950	74.3	50.20	500.3	......	......	......
New York, N. Y	164	29.857	70.2	42.70	510.3	124	168	73
Philadelphia, Pa	52	30.064	68.8	41.69	520.2	109	188	66
Chicago, Ill	661	29.317	69.2	35.47	490.3	99	173	93
St. Paul, Minn	811	29.133	67.3	29.50	430.9	102	178	85
Denver, Colo	5294	24.778	45.8	14.77	490.1	147	160	57
Santa Fe, N. M	7046	23.268	41.4	14.17	480.5	139	194	32
Salt Lake City, Utah	4348	25.644	40.3	17.52	510.8	129	159	75
Los Angeles, Cal	3 0	29.647	65.8	18.97	590.8	181	145	38
Cheyenne, Wyo	6105	24.004	59.0	11.32	14.0	143	179	43

The following is the average temperature from June, July, and August during the past sixteen years, as obtained from the Signal Service Office:—

Year.	Temperature.	Year.	Temperature.	Year.	Temperature.
	Deg.		*Deg.*		*Deg.*
1872	62.5	1878	64.3	1883	61.6
1873	66.7	1879	65.5	1884	62.6
1874	67.2	1880	68.0	1885	63.3
1875	62.6	1881	67.6	1886	64.9
1876	65.0	1882	62.7	1887	64.1
1877	64.2				

To show the comparative condition of health in Wyoming with other places, the following medical statistics of the U. S. Army are submitted. The troops of the United States are, perhaps more nearly than any other class of persons, subjected to the same surroundings and condition, and their habits are uniformly the same.

Localities by States and Territories.	Average No. of troops per year situated in each locality.	Average No. per year treated in hospital for disease.	Average No. per year died from disease.	Ratio to 1,000 of mean strength.	
				Treated each year for disease.	Died each year from disease.
Atlantic Coast New York to Maine	841.21	486.99	15.00	1,768.10	17.83
Arizona	1,168.32	2,481.15	14.15	1,134.14	12.11
New Mexico	954.79	76.02	7.42	1,231.70	7.77
California and Nevada	1,396.24	2,212.60	9.60	1,587.62	6.88
Pennsylvania, Indiana, and Michigan	438.25	561.75	2.65	1,282.58	6.05
Montana	622.74	720.90	3.50	1,157.62	5.62
Dakota	2,004.37	2,453.35	9.55	1,224.06	4.76
Wyoming	1,919.10	2,406.24	9.05	1,253.77	4.71
Oregon, Washington, Idaho	730.55	074.60	3.40	1,471.23	4.66

Climate being the atmospheric condition of a locality in relation to the phenomena of heat, cold, moisture, it has much to do with changing the tone and habits of the body and mind of mankind—it more or less affects animal life. Temperature is insidious in its effect upon the sensibilities of the human structure, in its work of strengthening or weakening them. Hence it is, that altitude and latitude are important considerations in the selection of human abodes. Scientific conclusions and practical observations are the best tests in this relation.

Experience, in very many cases, has amply demonstrated that the climatic characteristics of the elevated portions of the continent are more favorable to health and longevity, having a greater controlling influence over most diseases to which flesh is heir, than the lower altitudes on the sea-coasts and in the great river valleys. The climate of these latter regions is more or less affected by marine or ocean influences, which are very dissimilar to those of the great central elevations of the continent. The climatic influences on the coasts of the Atlantic and Pacific Oceans also vary.

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Along the same parallel of almost any degree of north latitude from east to west, from ocean to ocean, the atmosphere increases in warmth. Were it not for the heat of the tropical regions, which is distributed over the continent by atmospheric currents as well as by the thermal ocean and gulf currents, the high elevations of the Rocky Mountain regions would be too rigorously cold for habitation. But through these tempering influences they are not only habitable, but delightful and healthful portions of the continent; far more so than the Atlantic Coast, or the great river valleys which approximate the sea-level on either side of the great continental divide. The humid tropical winds and the equatorial warm Japanese currents of the North Pacific Ocean—which are similar to the Gulf Stream of the Southern Atlantic—reaching the western and southern shores of the continent, produce the mild and even temperature of these coasts, and, with climatic modifications, extend to the elevated Rocky Mountain regions of the interior.

These modifications are mainly produced by the high, snow-capped and almost unbroken mountain ranges of the western coast—the Cascade and the Sierra Nevada, the latter of which is covered with dense forests to an elevation of some 8,000 feet; while still above this lies perpetual snow. These, to some degree, are barriers against the extension of these warm atmospheric currents of the oceans over the interior Rocky Mountain elevations. Hence, as these mild winds, heated by the tropical ocean currents, sweep over the snow-capped mountain ranges and around their extremities, and thus pass over vast arid regions in their course to the great Rocky Mountain elevations, they become somewhat tempered, and give to them the salubrious climate that we have. The moisture that comes upon the mountain ranges, in the way of rain, during the rainy season of the Pacific Coast, is slight from January to May.

Up the Pacific Coast and north from San Francisco, and about west from Salt Lake and the southern limit of Wyoming, the humid Japanese currents strike the coast, as evidenced by the increase of rainfall. At Sacramento the average rainfall for the winter months of 1878, 1879, and 1880, was 12.53 inches; for the spring months, 6.94 inches; for the summer months, .04 inch; for the autumn months, 1.53 inches; making a total average of 24.04 inches for each of those years. At Fort Canby, Wash., 555 miles farther north, the average rainfall for the four seasons of the same year was: For winter months, 32.81 inches; for spring months, 13.66 inches; for summer months, 5.60 inches; for autumn months, 14.59 inches; making the total average 66.60 inches, or a difference of 42.57 inches in favor of the northern point. Again, the mean annual temperature at San Francisco is about 55°, while the mean annual temperature at Steilacoom, Wash., 650 miles north, is 51°—a difference of only 4°.

As evidence of the fact that the climatic temperature increases in warmth from east to west, it is only necessary to note that the mean annual temperature of Augusta, Me., on the Atlantic Coast, is 45°, while that of Steilacoom, Wash., on the Pacific Coast, is 51°. The mean annual temperature of Boston is 48°, while that of San Francisco is 55°. At Fort Bridger, in Southwestern Wyoming, about on this parallel of latitude from Boston to

San Francisco, and some 800 miles east of the latter place, the mean annual temperature is 41°, and this at an altitude of 6,753 feet above the sea-level, that much higher that that of either of the other terminal coast points.

As the North Pacific winds from the west pass over the Japan currents, they are warmed by superabundant heat, and bring both moisture and warmth to our western coast. Between the fortieth and forty-seventh parallels of north latitude they suddenly fall in temperature through a change of climatic conditions, and rainfall follows. Meteorological records near the mouth of the Columbia River note a total rainfall of over 7 *feet* during a single year.

The humid equatorial winds which thus approach the Pacific Coast, pass over the surface of the continent eastward, producing varied climatic conditions as they rise over and beyond the Cascade and Sierra Ranges, through valleys, over the great plains, and across the Rocky Mountain plateau, of which Wyoming is a part. These atmospheric conditions, with which this State is thus surrounded, give it a climate salubrious and enjoyable.

Wyoming being centrally located in the great elevation and plain region, has the advantage of varied climatic degrees through its mountains and valleys, its surface altitude being about 6,000 feet above the sea-level. From this general surface of the plains, mountain ranges, plateaus, and peaks rise from 6,000 to various elevations up to 13,850 feet, the altitude of the highest peak, and from the same general surface, the altitude of the valleys falls from 6,000 to various elevations as low as 3,500 feet above the sea-level.

Forests are not produced where rainfall, which includes snow, is less than 25 inches. Hence, the higher the mountain, the more the moisture; and moisture retains heat, and heat tempers the atmosphere, and gives us our various climatic conditions.

The average mean annual temperature of the entire State, which lies north of the isothermal line of 52°, is about 44°. In the mountain ranges it is sometimes as low an average as 36°; while on the plains on the east it averages 45° to 46°. In the Green River Valley region the average is about 42°, and in the Big Horn Valley about the same, while in the valleys of the Sweetwater, North Platte, and Powder Rivers, it is near that of the eastern plains.

The valleys of the Big Horn, Green, Sweetwater, and the North Platte extension of the latter are great distributions of the warm ocean current winds from the Pacific Coast over the State, the Green and Sweetwater valleys being connected by the South Pass, an opening between the Wind River and Sweetwater Mountain ranges; which, by the way, became historic as the great overland trail to the western coast before the advance of the Union Pacific Railway, and is said to have been first traversed by General Fremont.

The climatic influences thus outlined as culminating in Wyoming, make the State a superior region of the continent for the abode of mankind; superior because of its high, dry, mild and equable atmospheric conditions, with a salubrity unexcelled. Its greatest humidity is from the middle of autumn to the middle of spring, the remaining portions of the year being drier. In midsummer there are some few days when the heat rises to 90° at the meridian, but the nights are always cool. And so in midwinter there are some days, but seldom continuous, when the temperature falls to zero, and even far below, but it is not felt as severely as the temperature at 15° or 20° above zero in low humid altitudes of the coast or great river valleys.

The annual rain (including snow) fall of Wyoming prior to the past three or four years was from 9 to 14 inches, but during the past three years it has increased.

Although high winds sometimes prevail, cyclones and tornadoes never visit this State; neither are thunder storms frequent. These conflicts of the atmospheric currents are wholly incident to the vast plains below.

AS A HEALTH RESORT.

The climate of Wyoming has already, in many instances, practically demonstrated its controlling effect upon various dreaded diseases to which the human family are subject. There are numerous citizens who came here as a last resort, almost with "one foot in the grave," for relief from the pulmonary diseases so common in the lower humid altitudes east of the Missouri River, and to-day they are not only restored to health and vigor, but are active and prosperous in business pursuits.

The climate of this continent is fluctuating to a greater or less degree in all sections thereof; and, in the lower humid localities, sudden and harsh changes of temperature are severe upon the physical functions of mankind, and especially in engendering the incipient stages of pulmonary diseases, such as bronchial catarrh and other kindred affections of the lung tubes. But in the higher and less humid localities, with similar variations of the temperature, these climatic conditions but rarely exist, because of the dryness of the atmosphere and other similar atmospheric influences; viz., a light, pure, rarefied atmosphere, free from miasmatic vapors which prevail in low humid localities; modified chemical and electrical properties, which heat rather than aggravate; demonstrated by their action upon dead animals in retarding decay; and the clear, unobstructed sun rays.

In this State it is the opinion of medical practitioners of acknowledged learning, of close observation, and of long and skilled practice, that these climatic conditions have their influences; also, that the change from a low miasmatic locality to a higher one free from those conditions, stimulates new physical activities during the process of acclimation, and thus infuses new life into invalids, or those who are breaking down under the earlier stages of disease.

But few diseases germinate in Wyoming. Indeed, lung affections, such as bronchitis, lung fever or pneumonia, and pleurisy, rarely occur. Hence persons who have any predisposition to consumption find this climate favorable for its eradication or at least a prolonged lease of life. Many instances of recovery have occcured here; in fact it is the general result, nine-tenths of the persons who have sought this climate for benefit from lung troubles, unless they were in the last stages of consumption, having been restored. Many persons who have reached the stage of hemorrhage from the lungs,—which is regarded by medical men as a dangerous degree in the progress of the insidious disease,—have come to this locality and in the course of time have been restored through climatic influences. However, there are advanced stages of the wasting away of the lungs beyond which no medical treatment nor climatic influences will restore the afflicted.

Persons from low humid localities, who are predisposed to consumption, and those whose habits are sedentary, or who are dyspeptic and broken in health, or with a hacking cough, should come to the elevated, dry, invigorating climate of this locality, and gather new physical forces.

No fevers originate in this State except a species called "mountain fever," which prevails in autumn and early winter after very dry summers. Bilious attacks are prevalent here in the spring and summer; however, they are easily controlled. Acute rheumatism and neuralgia are uncommon here, but slight attacks are frequently felt. Persons affected with a seated disease of the heart should not come to this altitude; but those suffering from general nervous debility or dyspepsia will find Wyoming an excellent climate for its cure in due course of time. Persons of a defined nervous temperament will find Central and Northern Wyoming more suitable for them than the higher altitude of the southern part of the State, especially during the winter months.

As a region for asthmatic people, Wyoming has few equals, as many residents within its limits will attest. The worst cases of this distressing lung trouble find sure cure here. Many hundreds of people of all ages thus afflicted have come here from the low altitudes of the east and west, and been restored to health in due course of time.

Wyoming certainly has very superior climatic advantages as a pleasure and health resort

HYPSOMETRIC AREAS.

The following table contains the hypsometric areas or elvations of land in Wyoming.

Area between—	Square miles.
3,000 and 4,000 feet	3,000
4,000 and 5,000 feet	19,000
5,000 and 6,000 feet	20,000
6,000 and 7,000 feet	24,000
7,000 and 8,000 feet	17,000
8,000 and 9,000 feet	7,200
9,000 and 10,000 feet	4,500
10,000 and 11.000 feet	2,500
11,000 and 12,000 feet	900
12,000 and 13,000 feet	100
Total	97,800

WEATHER STATISTICS.

Rainfall. mean temperature, direction of prevailing winds, and humidity at Cheyenne, Wyoming, from 1871 to 1888.

RAINFALL.

YEAR.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total year.
	Inch.	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*
1871	0.28	0.07	0.11	0.95	2.04	2.25	1.27	0.36	0.74	0.24	0.66	0.16	9.13
1872	0.02	0.27	0.38	1.61	1.99	1.84	3.90	2.05	1.03	0.33	0.08	0.03	13.48
1873	0.03	0.02	0.38	0.92	2.41	1 77	1.10	2.07	0.36	0.70	0.17	0.80	10.73
1874	0.11	0.11	0.74	0.61	1.50	1.34	1.87	0.44	0.93	1.86	0.04	0.16	9.71
1875	0.42	0.06	0.23	0.50	1.20	0.29	4.47	2.12	1.34	0.60	0.84	0.08	12.10
1876	0.02	0.06	0.54	0.23	2.50	0.10	0.79	0.26	0.00	0.00	0.32	0.21	5.18
1877	0.29	0.14	0.98	1.11	2.24	1.27	0.43	0.83	2.02	1.99	0.17	0.33	11.71
1878	0.08	0.13	1.16	0.19	4.46	1.71	1.43	2.50	0.75	0.04	0.00	0.19	12.64
1879	0.32	0.20	0.44	1.66	1.30	0.07	1.04	1.26	0.00	0.65	0.23	0.17	7.34
1880	0.20	0.09	0.06	0.17	0.44	1.06	1.88	2.23	1.05	0.76	0.36	0.08	8.38
1881	0.36	0.22	0.32	2.82	1.14	1.19	1.40	1.97	1.75	0.88	0.29	0.01	11.85
1882	0.14	0.05	0.06	0.46	2.73	1.85	2.30	0.23	0.35	0.31	0.06	0.10	8.64
1883	0.88	0.25	0.85	2.76	3.62	3.67	1.45	2.18	0.90	1.66	0.16	0.80	19.24
1884	0.76	0.26	1.59	1.38	4.83	1.50	0.60	2.07	1.35	0.50	0.18	0.67	15.54
1885	0.16	1.31	0.51	3.76	1.33	2.75	1.91	2.14	0.69	0.28	1.11	0.16	16.11
1886	0.52	0.84	1.36	1.14	0.32	1.52	0.71	1.61	1.05	0.37	......	......	......
1887	......	......	0.06	0.80	0.24	0.29	0.84	0.36	0.78	0.25	0.16	0.11	......
1888	0.29	0.72	2.04	0.94	3.74	0.56	2.31	1.15	1.66	0.30	0.57	0.21	14.49
Mean	0.28	0.34	0.66	1.19	2.12	1.39	1.65	1.43	0.92	0.65	0.31	0.25	11.63

TEMPERATURE.

	Maximum.	Date.	Minimum.	Date.	Mean of year.	Prevailing wind.	Humidity.
	Deg.		*Deg.*		*Deg.*		*Deg.*
1872	......	......	—14	Dec. 21	43.8	W.	51.8
1873	94	July 5	—17	Jan. 27	44.7	W.	48.3
1874	98	July 4	—24	Feb. 24	45.5	W	48.1
1875	98	June 21	—38	Jan. 9	42.7	NW.	59.7
1876	96	July 6	—14	Dec. 24	44.3	NW.	49.7
1877	96	July 5	—14	Jan. 22	44.2	NW.	55.2
1878	92	July 14	—12	Dec. 25	44.2	NW.	57.4
1879	95	July 12	—24	Dec. 24	46.3	W.	45.4
1880	97	July 19	—24	Dec. 28	42.9	NW.	44.5
1881	100.5	July 14	—12	Feb. 14	45.8	NW.	52.5
1882	96	Aug. 1	—15.5	Nov. 12	43.9	NW.	47.9
1883	94.2	July 1	—31.3	Jan. 20	42.4	NW.	52.6
1884	93.4	June 27	—28.2	Feb. 12	42.6	NW.	56.0
1885	89.9	July 15	—18.6	Jan. 16	44.0	NW.	63.6
1888	97.2	July 11	—27.2	Jan. 14	44.5	NW.	50.4

NATURAL RESOURCES.

In the natural resources of a State or Territory lies their material wealth; and the more varied these are, the greater their future possibilities.

In these natural resources Wyoming abounds; and when enterprise, capital, and skill shall have fully uncovered them for utilization, its industrial resources and wealth will bear comparison with any similar section of the continent. It has only been a brief period since its domain has been, to any great extent, intelligently explored or settled, mainly because hostile Indians were a check to this end; because the reputation the State has achieved as a stock-growing region has overshadowed the mining interest, and because the huge mineral "finds" in Colorado, and other surrounding localities, happening some eight or ten years ago, drew the attention from this State.

However, Wyoming is rapidly recovering from these temporary drawbacks, and the recent mineral developments are bringing it forward with encouraging prospects of a healthy and permanent "boom."

Down to the present time, geological and expert investigations have discovered that gold, silver, copper, iron, lead, kaolin, fire-clay, graphite, mica, antimony, gypsum, soda, magnesia, sulphur, granite, marble, limestone, sandstone, petroleum, coal, etc., are among Wyoming's minerals. Of these

GOLD

Was first discovered here in 1867, between the base of the Rattlesnake Mountains and the Sweetwater River, and along the old emigrant trail near the South Pass. Prior to this, however, fabulous stories had been told by trappers, hunters, and others about discoveries of precious metals in this region. Soon after this discovery large numbers of fortune-seekers gathered in this locality, and camps rapidly accumulated, which to-day bear the names of Miner's Delight, Atlantic City, Lewiston, South Pass City, all within a radius of some 10 miles of each other, and about 125 miles north of Green River City, on the Union Pacific Railway. The lode or fissure vein mining was in the granitic-gneissoid rocks. Their surface decomposition produced ore which has been mined quite profitably. Some $200,000 have been produced by one of these mines alone. A crushing mill was erected at these mines. Gulch mining has been carried on to a greater or less extent, and with success. A French company, under the management of a French engineer, acquired these mines by relocation.

From this discovery others were subsequently made, some 90 miles eastward on the Seminoe Mountain of the Sweetwater Range, which exhibited similar formations, and which are now being developed with fine success. The two principal peaks of the Seminoe are Young's and Bradley's, whose elevation is about 10,000 feet above the sea level. On the eastern slope of Young's Peak are a number of gold mines, which Professor Aughey (geologist), who thoroughly examined them, states are of high grade and character. Of these mines the principal ones are Star, Hope, King, Bennett and Meager, and Deserted Treasure. The ore of all these mines is free milling gold quartz, and is more or less developed; the most work, however, is being done on the Deserted Treasure mine. The Territorial geologist, who has given these mines much personal attention, states that the other mines named show equally as well as the Deserted Treasure did at the same stage of development.

There are many other undeveloped prospects on this mountain other than those named, which bear good indications.

Other discoveries are also made on the east and west side of the Medicine Bow range of mountains, southwest from Laramie City, near the Colorado line. The veins are similar to those of the Seminoe mines, mainly quartz and schists. The ores of the east side mines are gold, both free and in iron pyrites, lead and copper carbonates. In one of these mines, partially developed, the vein is said to be from 5 to 25 feet wide. It has been developed to the depth of 50 feet, and shows gold from $10 to $60 per ton.

The Douglas Creek mines of the west side of the range are similar to those just mentioned. Profitable work has already been done on them by a company, which demonstrates that they will pay largely with proper management. This mining district was first known as the Last Chance region. The work first done was gulch mining, but the more recent work has been that of quartz mining. The mines are over 9,000 feet above the sea level, and show many veins of gold-bearing quartz, which frequently appear in the outcroppings of the rocks.

In the valley of the Little Laramie River, some 30 miles west of Laramie City, the mines called the Centennial were discovered in 1876, which at first proved to be rich. The region is supposed to be a good one, but requires skill and capital to develop it.

In that portion of the Black Hill region lying in Northern Wyoming, which is about one-third of the entire group, more or less gold is found through the gulch-mining process, especially in Bear Lodge Mountains, Nigger gulch and Sand Creek. Quite considerable nuggets have been found in these localities.

The Lost Cabin mine, of which so many romantic tales have been written, is situated near the Big Horn River. It was discovered ten or twelve years ago. Recently it was prospected and an assay made, showing about 3 ounces of gold to the ton and a trace of silver.

The more recent developments of gold production are in the Silver Crown district, some 22 miles northwest of Cheyenne. While this is more especially a copper district, yet the ore of Copper King mine bears 3 ounces of gold per ton of ore, and the present indications are that this mine will increase in its gold production.

THE GOLD HILL DISTRICT.

Gold Hill is situated amidst rugged surroundings in the Medicine Bow range of mountains in Carbon County. It is about thirty miles north of the Colorado State line and thirty-two miles in an air line south of the main tracks of the Union Pacific Railway. The country in general appearance is similar to the Black Hills of Dakota, and somewhat like the Judith Mountains in Montana surrounding the mining camp of Maiden. There is an unlimited supply of timber and water. The altitude of Gold Hill is 10,000 feet above sea level. There are numerous lakes in the vicinity. Mr. B. P. Arendell first discovered gold here in August, 1889. He is now interested in more than thirty-five claims, and it is said that, figuring at the rate claims have been already sold, he could now clean up $10,000 at the very least. So it may be said that at least one man has already made his little stake in the mines of Brush Creek.

The usual, in fact the only available route at present, is to take the Union Pacific road to Fort Steele, and from that point to proceed by stage or private conveyance to Saratoga and thence to Gold Hill. Saratoga is distant from Fort Steele 28 miles, and Gold Hill from Saratoga 28 miles. There are, or, rather, will be five roads from the Union Pacific Railroad to Gold Hill. Laramie, Rock Creek, Carbon, Fort Steele and Rawlins will each claim their share of travel. The Saratoga road is an easy, natural grade, and to one who has had an experience of ten years in freighting, it looks as if the bulk of machinery and heavy goods must go into the mines via Saratoga, leaving the Union Pacific at Fort Steele.

About 125 locations have been made here and all in a district about two miles square. Eleven claims are being worked and upwards of 1,000 tons of pay rock are on the dumps. A custom stamp mill will pay as soon as one can be brought in, and the miners say now is the time to bring it in.

The following named gentlemen have also shown their faith by investing some cash in the new mines: Hon. J. F. Hittle, J. M. Ramsey, E. L. Brown, Mr. McMicken, J. C. Davis, H. Hansen and Judge Homer Merrill, of Rawlins; L. Sartoris, M. Dawson, Mr. Lee, P. Mandell, M. P. Woods, N. F. Spicer, Col. Downey, and others, of Laramie; W. B. Hugus, Bud Beal, J. H. Mullison, and others, of Saratoga. Besides this almost every man in Saratoga and some others have grub-staked some prospector or in some way interested themselves in the mines.

Mr. Lewis Johnson, who is interested in the Acme, is backed by Park City, Utah, people. He left for that place recently, and will, no doubt, interest more of his friends, as he goes well fixed for that purpose. Mr. Johnson is an experienced miner. He is acquainted with nearly all the Utah mines and those of Butte, Montana, and judges from present indications that Gold Hill will be a great camp.

Clinton Folsom is another old miner who thinks Gold Hill the biggest thing since Leadville was struck. Mr. Folsom has been through most of the mines in Colorado, Utah and Idaho. All that is needed to give anyone faith in Gold Hill is to visit the camp. The writer is neither geologist nor miner, but he has been in a good many mining camps and mines in Colorado, Montana and the Black Hills, and would not be surprised if Gold Hill should prove to be the greatest camp in the United States. Of course there is no positive assurance of this yet, as the leads may pinch out. Such is not probable, however. So far all of the leads have improved from the surface downward.

CONSERVATIVE TESTIMONY.

The following extracts from a letter received from J. F. Crawford, Esq., of Saratoga, will be found unusually interesting. Mr. Crawford has been a resident of Saratoga for thirteen years, is a gentleman of high character, and also thoroughly posted concerning this section of Wyoming. In a letter dated March 3d, 1891, Mr. Crawford says:

"Many of the leads have been developed somewhat during the past winter, and each and every one has, so I am informed, got better as they got deeper—showing a better quality of quartz, as well as increasing in quantity and solidity. There never has been any particular excitement here over the matter, but all has been marked by that quiet steady faith which has carried everyone along with it. There has not been a day that has not been marked by some event which has added to the confidence in the mines, and I have no hesitancy myself in saying that I believe it will be the greatest camp in Wyoming, if not in the West. I might add that, while Gold Hill holds the attention of the public just now, that there are three or four other localities that will prove quite as rich in minerals as that place, and they are all within a radius of thirty miles of this place, some in the Medicine Bow range and some in the Sierra Madre.

"As to the country around Saratoga! The valley is V shaped with the point resting on the edge of North Park, and the North Platte River flowing through the center. There are some 14 or 15 tributaries to the Platte, flowing from the mountains on either hand. Not only the Platte River is thickly settled, but each one of these tributaries is inhabited clear up into the mountains. The soil, under irrigation, will produce equal to any country, and water is abundant. All the cereals are raised easy and in abundance, as well as all kinds of vegetables. Tame grasses, such as timothy, red top and Alfalfa, do well here, especially timothy. Native grasses are rich and nutritious. It is also a good grazing country, and all kinds of stock do well. Stock wintered here during 1889-90 better than anywhere in the West, as was evidenced by the fact that in April, 1890, there were bought and shipped from this valley between 1,200 and 1,500 feeders—steers from two to five years old. The people are well to do. They have their ranches enclosed, own some cattle—all the way from 50 to 500 head each—and all are making some advancement, while some are getting quite well to do. Yours truly,

J. F. CRAWFORD."

SILVER.

This metal is not found in Wyoming to the extent that gold is; in fact, it is only found in moderate quantities, and comparatively in but few localities. In the mining localities of Medicine Bow or Snowy Range of mountains it appears in connection with gold deposits; also indications have been found on the western slope of the Laramie Range on Rock Creek, west of Laramie City, and in the Wolf and Big Horn Mountains. It has also been found northwest of Cheyenne, on the eastern slope of the Laramie Range. Localities of this latter region have been worked to a considerable extent. Silver has also been found north of Fort Laramie, at Rawhide Buttes, and on the Running Water farther north. In the latter region quite a number of large claims have been located. These rocks are quartz impregnated with copper, while strata below show veins of native silver, and still lower veins of silver and gold. Discoveries of silver have also been made on the Stinking Water in the northwestern part of the State, which may pay well when developed.

The Silver Crown district of the Laramie Range, while it is a distinctively copper-bearing region, its ores carry more or less silver, as has already been shown by the development of the Copper King and King David mines.

Thus it will be seen that gold and silver are important parts of the natural resources of Wyoming, and when they receive the attention, appliances, and capital necessary to obtain them to the extent they are known to exist, they will add largely to the material wealth and industrial interest of the State.

COPPER.

The next most important of the finer metals found in Wyoming is copper. Only within the past five or six years has this metal been discovered and mined to any considerable extent, although its existence in various localities was known.

In a region north of Fort Laramie, adjacent to Rawhide Buttes, prospecting began some five years ago, and several leads were found which produced a rich quality of ore, and considerable work was done.

The Platte Cañon district, a few miles southwest from Rawhide Buttes, has been prospected for several years and deposits found to such an extent that capitalists erected smelting works on the north bank of the North Platte River, at the mouth of the cañon, and December 1, 1882, the first run was made. Many million pounds of copper bricks or bullion have been made and shipped to markets east by the Wyoming Copper Company. Everything used to operate these works was freighted by wagons 100 miles from Cheyenne, in the absence of railroad facilities. The principal mine of this locality has produced over 3,000 tons of ore; two or three other shafts have also produced well.

The Medicine Bow Mountain range region has also shown copper deposits in several localities, near the source of Crow Creek and Grand Encampment Creek in the Upper Platte Valley, and some 40 miles south of Fort Steele. The opening of a claim in this region by a tunnel exposed a vein of copper ore some 2 feet thick. Other claims in the same locality have given evidence of leads of ore. The copper claims near the head of Grand Encampment were patented by an Omaha company several years ago, and assays have shown nearly 25 per cent copper and a trace of silver.

Farther west some 70 miles, in the southeast corner of Sweetwater county, are found mines near Bagg's Hole which have produced good specimens of copper ore. So, also, localities on the southeastern slope of Wind River Mountain range, near Inya Kara, in Crook county, and at recently-discovered localities in Uinta county, show the presence of copper awaiting the skill, muscle, and capital of the miner to secure it.

The Silver Crown mining district is now grandly at the front and is attracting much attention. It lies some 22 miles northwest from Cheyenne, at the eastern base and slope of the Laramie Mountain range.

It has been known for years that copper existed in this range of mountains, which induced a test mine, the "Metcalf," to be opened, at which was established a rude smelter. The veins of copper were found to be from 2 to

3 feet thick, with a grand dip from the southwest to the northwestward, and in some places they are almost vertical. They lie almost uniformly on shaly rocks.

After the opening of the Metcalf copper mine, several assays of the ore were made as follows:—

From one vein the ore showed 30 per cent of copper, $10.36 per ton of silver, and $10.33 per ton of gold. Another assay, made at the United States mint at Denver, showed the ore to contain 46 per cent of copper and $20.25 worth of silver per ton of ore. And still another assay, made by the Omaha Smelting and Refining Works, gave the following result:—

"We find that the ore left with us contains 1.65 ounces of silver per ton, a trace of gold, and 40 per cent of copper. A selected piece of this ore yielded 57.40 of copper"

There are the King David, Metcalf, Copper King, and the Fairview. Of these the King David is now the best developed. The ore is mainly copper glance, with copper pyrites, barmite, and some oxides. This ore also carries some silver, as already noted.

This district is remarkable for the large number of veins that can be traced to the surface. It is the opinion of mining experts that these mines, when fairly developed, will show a locality extremely rich in this metal

The King David is now being worked, and a shaft already extends 180 feet deep, with various levels extending from it in four directions. The ore body is some 300 feet wide, in which the copper occurs in the form of a suboxide, copper pyrites, etc. From the surface to the present bottom of the shaft of the Copper King lode the ore increases in percentage, and a recent "pay streak" ran as high as 14 per cent of copper and 3 ounces of gold per ton. Much interest is being manifested concerning the output of the Silver Crown mining district.

In addition to the copper localities thus defined, prospecting in various other sections of the State has been carried on with varied results.

LEAD

In the Silver Crown mining district lead is found to a considerable extent in the forms of galena, selenide, wulfenite, and carbonate of lead. Wide formations of the selenide variety of lead are found with uranium. In other near localities, lead is found in the form of carbonates and selenides. On the range west of the Seminoe Mountain are deposits of silver-bearing carbonates and sulphates of lead.

The foregoing are all the localities thus far made known in which lead is found.

TIN.

This rare and valuable mineral product was, some years ago, found to exist in the northeastern part of the State, in portions of the Black Hills extending into Wyoming. While on the Wyoming side the mines have not yet been developed beyond the extent to determine their character and scope, those on the Dakota side are now being opened, and works at Rapid City are being constructed for the reduction of the ore.

These are the only tin mines in the country, so far as known, hence they will become valuable additions to the mineral resources of this State.

In assaying this ore, small quantities of mercury, cobalt, paladium, and nickel have been found.

IRON.

This metal, though of the baser species, is doubtless of more importance in the economic uses to which it is so largely applied, in developing the civilization of the nations, than are all the precious species. Hence its supply in the interest of national progress is important, and those regions where nature has deposited it are fortunate, as its production adds to them employment and wealth. The deposits of this valuable metal in Wyoming are extensive.

Professor Aughey says: "These conditions—an abundance of the best ore, easily accessible, and fuel and fluxes close at hand—are present at the southwestern base of the Seminoe Mountain to a degree rarely found elsewhere on the globe. Only one thing is lacking; namely, transportation facilities. . . . Should the railroad projected down the North Platte be built, it would run so close to these iron-ore bodies that transportation for them could easily be provided."

The same authority says that his investigations determine that three kinds of iron ores are developed in Wyoming—the hematite, iron carbonate and magnetic iron, the two former being the most prominent.

The hematite ore is found at the base of Bradley's Peak on the Seminoe Mountain, 9 miles west of the Platte River in its course from the south to the north and 26 miles northward from Rawlins. An analysis shows this ore to be of superior quality, and a scientific measurement of its area also shows it to be practically inexhaustible. The spathic or iron carbonate ore is found in moderate quantities in the Big Horn Basin; it appears in sheets, and is also found in the basin on the east side of the South Powder River. The quality of the spathic ore is superior and valuable, as containing important elements required in the manufacture of Bessemer steel. Its color is dark brown, blackish, and black. In the Powder River localities, the beds are some 4 feet thick. These ores are also valuable for making *spiegeleisen*, so largely used in the manufacture of Bessemer steel, which is so rapidly taking the place of iron for railroad tracks.

Iron is also found on Iron Mountain, of the eastern slope of the Laramie Range, some 40 miles northwest from Cheyenne; but an analysis of this ore shows that the large percentage of titanic acid makes it difficult to reduce.

The State geologist reports that all the essential requirements exist at the Seminoe mines—such as inexhaustible beds of the best quality of hemitic ore, a vast field of good coal for fuel and cokeing, plenty of lime for fluxing purposes—for the cheap and profitable manufacture of iron, and Bessemer steel as well.

MINERAL PAINT.

Large bodies of red oxide of iron exist in extensive quantity near Rawlins, Carbon county, which, when reduced to powder, makes a durable red paint with great preservative properties. Two mills have been employed in crushing and preparing the oxide powder for use and shipment, worked by the Rawlins Metallic Paint Company. They have already expended some $25,000 in opening the mines and erecting paint works. The paint made from this powder is used by the Union Pacific Railway Company for painting their buildings, poles, etc., along their entire line, besides being used extensively for private buildings in the State. The superintendent of the car-building department of the Union Pacific says:—

"We use it exclusively for painting box and flat cars, iron and tin roofs, and buildings along the road, and have found it a valuable preservative of wood. We are satisfied that it will cover more surface, pound for pound, last longer, and retain its color better than any paint before the public.

"This red oxide also makes an excellent flux for the reduction of silver ores. Many thousand tons have been shipped for this purpose since the opening of the mines."

KAOLIN.

Kaolin is a species of fire-clay formed from decomposed feldspar, which, compounded with a fusible earthy matter, was used for making porcelain or Chinaware, first in China, but later in this and other countries. It is found in quite superior qualities along the Laramie and Sweetwater Ranges.

FIRE-CLAY.

Fire-clay, a mineral composition of silicate of alumina, used for making fire-brick, because of its resistance against the action of heat, is an important material for many industrial uses, such as assay retorts, fire-grates, etc., and is abundant in Wyoming along the Laramie and Wind River Valleys and various other points throughout the State.

GRAPHITE.

Carbon, in one of its conditions, known for its soft, metallic luster, and commonly known as black lead, is found in the disturbed sections of the rocks, and appears in veins lying at various angles. It exists in the Laramie Range, where several mines have been located. The material as it comes from the mines is from 70 to 80 per cent pure, and presents, when pulverized, a bright luster. These deposits are regarded as valuable, and will be profitable when utilized.

MICA.

This useful mineral is found plentifully in Wyoming. It easily cleaves into very thin, transparent, and elastic plates, and is used for lanterns, in stove doors, etc. Deposits are found in the southern part of the State and on the eastern slope of the Upper Laramie range. The surface of the blocks found will measure 8 or 10 inches square, and when divided into thinnest dimensions it is remarkable transparent.

SODA.

Among all the minerals of Wyoming none show such generous and wonderful deposits as those of soda. It finds its lodgment in open basins, once ponds of water, into which salts of soda found their way and through chemical action solidified into masses some 10 to 15 feet deep.

There is a group of these deposits within a moderate radius of each other, located some 12 miles southwest from Laramie City, which belong to the Union Pacific Railway Company, the largest covering an area of 56 acres. They are the sulphate of soda deposits, and have a depth of solid soda from 10 to 15 feet, and the entire area of all of them is estimated to contain some 50,000,000 cubic feet of pure, solid, crystallized sulphate of soda.

Works were erected at Laramie City some seven years ago for the preparation of the soda for use, and is developing into one of the great industries of the State.

There are other lakes of bicarbonate of soda located along the eastern base of the Rattlesnake Mountains, in the Sweetwater River Valley. Four of these, covering an area of 440 acres, are in one group near Independence Rock, and the other one is some 20 miles westward, and covers an area of 220 acres, but is not yet developed. Some four years ago, the owners had their soda tested in glass works at Pittsburgh, Pa., and found that glass could be made with the soda in its crude state.

Other soda deposits have been found in the State, among which are some valuable ponds in the region of Old Fort Casper, in the Platte Valley.

These soda deposits of Wyoming are doubtless the result of evaporation.

It is asserted that the soda consumption of the United States amounts to about 250,000,000 pounds a year, all of which has been imported at a cost of about $48 per ton at landing, besides the duty of about $50.40 per ton. A well-informed and practical economist says of this commodity, that it is imported at an annual expenditure of $7,000,000, whereas this could be saved by the preparation and consumption of our own product, which is pure and abundant. The time is coming when this will be done.

MAGNESIA.

This mineral is found along the line of the Union Pacific Railway, near Rock Springs, of a very pure character. Its deposits are several inches thick, and cover an area of 100 acres or more, so far as already discovered.

SULPHUR.

On the Bear River, in the Southwestern part of the State, and in some other localities, this mineral is found, is excellent in quality, and can easily be utilized for economic purposes.

GYPSUM.

This important mineral production exists extensively in various localities of the State. Deposits are found in the northwestern part of Crook county, on the eastern slopes of the Big Horn Range, in the Wind River and Sweetwater valleys, and in the southern part of Uinta county, near Red Buttes, a railway station in Albany county on the Laramie Plains, and along the northern slope of the Laramie Range, between Forts Fetterman and Laramie. Many points in this area, thus covered by these valuable deposits, can be reached by railroad. Gypsum is already quarried, and it is only a matter of time when it will be more generally utilized for economic purposes

ROCK SPECIES.

Nature has been lavish with Wyoming in its supply of the various rock species, so essential as material for construction purposes and other economic uses. They are found generally distributed over the State in excellent qualities, and add largely to its material wealth.

The most enduring and "eternal" of the rock species of the State is the granite, of which there are several varieties, of nearly all colors and intermediate shades, including the gray, brown, red, etc. Of these varieties some are coarse-grained and more readily yield to the elements in disintegration, while others are fine-grained and tenacious of texture, and are susceptible of high polish for monuments, pillars, etc. The granite rock appears more or less in all of the high peaks and mountain ranges of the State. The celebrated Oakes Ames monument at Sherman, the highest elevation on the line of the Union Pacific road—8,247 feet above the sea level—is made of gray granite found at that point. Specimens of Wyoming granite from various localities have been sent to geologists in different parts of the East, all of whom are in accord as to its character for utility, durability, and beauty.

Wyoming marble is a rock species of beauty. It is found on the Laramie Plains, east of Copper Lake railroad station, in ledges nearly 100 feet wide and some 2 miles in length. It is crystalline in character, very fine grained, and is susceptible of a high and beautiful polish. It is also found to some extent in other localities. However, no quarries are worked yet, except those at Cooper Lake. When this marble shall be utilized, Wyoming can furnish its own marble monuments, furniture, and mantel slabs. Specimens of this marble, which resembles the Italian variety, have been sent to artisans eastward, who have tested its texture, durability, and utility for the higher economic uses, and pronounce it superior.

Limestone is another important rock species of the State, and is found in great quantities in all sections thereof. It comprehends the carbonate, which yields to heat, and slacks into a powdered condition of lime used for plastering, glass, flux, and for various other purposes, while the white and red of jurassic formation is also extensively found, and is of a tenacious, hard, metallic quality, susceptible of a fine, marble-like polish, and is extensively used for building and other purposes.

Sandstone is also one of the leading species of our rock formations, and appears in all directions and forms from mountain ledges to the fantastic buttes, monuments, etc. The variety includes the white, gray, and red, and is largely used for building purposes

Brick clay also exists in almost all parts of the State. Brick-making is carried on in Cheyenne, Laramie, and other points quite extensively, producing a good quality

COAL.

Wyoming is remarkably prolific in its coal measures. They extend in almost every direction, and well-nigh form the most important of her natural resources. Were it not for the coal as an artificial heat generator, its other concomitants, gold, silver, copper, iron, etc., could not be utilized within their own fields; hence, would not be of so material benefit. Were it not for coal, we would have to resort to the old methods of water and the horses for motive power in mining and other industrial interests. Without coal, we would have no blast furnaces, factories, and mills.

It is estimated by scientific experts who have surveyed the State quite extensively, that the distribution of coal comprehends fully one-fifth of its area. Thus nature has been generous in its supply of this mineral for fuel purposes, which is so important in the utilization of the various other minerals which are interspersed with it throughout the State domain.

Traversing the southern part of the State, south of the Platte and Sweetwater rivers, from east to west, vast measures of an excellent quality of bituminous coal are found at Cooper's Lake and near Laramie City, in Albany county; Carbon, Carbon county; Rock Springs, Sweetwater county; Alma, Uinta county, and Twin Creek on the Oregon Short Line. Among these are the mines belonging to and operated by the Union Pacific Railway Company. The first of these mines was discovered by E. C. McShane, followed by the discovery of others within the land-grant limits of the Union Pacific road.

Besides these mines along the Union Pacific road, there are extensive mines just south of the Seminoe Mountains, in Carbon county—some eleven leads, ranging from 1 to 15 feet in thickness. The coal is of an excellent quality, as shown by the following analyses kindly furnished by the Territorial geologist:—

	Per cent.
Fixed carbon	52.0
Volatile matter	41.0
Water	4.0
Ash	2.5
Loss	.5
	100.0

Another bed just west of the above shows thus:—

	Per cent.
Fixed carbon	51.06
Volatile matter	37.08
Water	5.72
Ash	4.90
Loss	1.24
	100.00

One of the largest areas of coal land commences east of the Wind River Mountains, and extends in an unbroken line eastward to the Platte River near its great bend, a distance of about 120 miles. Along this belt, says Professor Aughey, there are from three to eleven coal beds, varying in thickness from 2 to 20 feet. The following are analyses of the coal of this belt, the first from near where the Beaver joins the Wind River, the second a few miles farther east, and the third from a bed north of the Big Horn Mountains:—

	First.	Second.	Third.
	Per cent.	*Per cent.*	*Per cent.*
Fixed carbon	53.07	48.99	58.08
Volatile constituents	36.08	36.49	35.01
Water	4.01	5.98	4.02
Ash	5.00	7.18	2.06
Loss	1.84	1.36	.83
	100.00	100.00	100.00

Passing to the Sweetwater and North Platte Rivers, the coal measures are equally extensive. The region along the North Platte River, from Old Fort Casper to Fort Fetterman, and for a great distance east of there, is nearly all underlaid with coal, most of which has been analyzed and found to be of a superior quality.

Coal is also found in the Green, Snake, Big Horn, and Powder River Valleys; and while the constituent properties of all these measures and veins have not yet been determined, yet veins have been opened and coal used for local purposes throughout quite an extent of these various localities, and found to be good for practical uses.

Beds of coal are also found in Johnson and Crook counties, extending to the Black Hills region; and passing southward, it is found east of Fort Fetterman and at other points in the Platte Valley.

A former geologist of this State, in his report, said: "It has been proven in the last ten years that the coal generally in Wyoming is good; and for locomotives, the blacksmith forge, roasting furnaces, and household uses, it will answer all the requirements that may be made upon it. While no cooking or good gas coals have as yet been found along the Union Pacific Railway, yet it is not unlikely that careful examination of the regions along the Platte and Sweetwater may reveal such deposits. In Colorado, where coal is geologically the same as in this Territory, not only excellent coke and gas coals, but even anthracites, have been discovered in favored localities."

More recent explorations have discovered that the latter qualities of coal exist in Central and Northern Wyoming, but how extensive is not yet known.

The retail prices paid for coal by consumers vary from $1.50 to $6.50, according to the amount purchased, locality where delivered, and quality of the coal purchased.

Dr Hayden, United States geologist, in his survey of Wyoming in 1870, speaks generally of its coal measures as follows:—

"The coal of the Rocky Mountains is distributed along their flanks as several leaves in the great book of folded strata, and invariably in the transition beds or between the tertiary and cretaceous. Nowhere in the world is there such a vast development of the recent coal measures, and in few places is their existence more necessary to the advancement and improvement of the region in which they occur. They lie regularly and in the main quite horizontally, though close to the mountain the beds are naturally tilted. The coals are called variously, lignites, brown, semi-bituminous, and bituminous, though from their chemical constitution they ally themselves more nearly with the latter. They are distinguished by their cleavage-planes, which latter are nearly perpendicular to the planes of lamination and to each other, and give to this coal (which is usually friable) a stair-form structure almost resembling the crystallization of some clusters of iron pyrites. It is hardly worth while to say that these coals differ in different localities as to general structure and chemical composition."

PETROLEUM.

Petroleum, an inflammable, bituminous liquid, exists in Wyoming in vast quantities, as has been demonstrated by discoveries for several years past. For a long time after the first discoveries, the general public was slow to dispel its doubt or comprehend the extent of its existence, but now it yields to the force of practical demonstrations.

In the annual report of the Territorial geologist, there is the following in relation to petroleum:—

"I have during the last few years re-surveyed a large part of the Territory of Wyoming, and here submit the conclusions arrived at and the data for them.

"Indications of the existence of petroleum have been found over a much larger territory than was originally suspected. Even the marked proofs of its presence are found over a comparatively large area, large when compared with that of Pennsylvania, where the entire productive area, according to late official reports, covered only 39 square miles. Although the Pennsylvania oil fields have since been found to be more extended than at the date the report refers to, it does not in this respect prospectively compare with that of Wyoming."

The most extensive oil basins of the State lie east of the Wind River and north of the Rattlesnake range of mountains. This belt is about 130 miles eastward, and at various intervals the oil is found to come to the surface, and also much of the rock masses are found to be saturated with it. The survey shows that while this vast oil belt extends east and west, its most noticeable basins are northwest and southeastward, somewhat in the order and range of Fort Washakie, Lander, Shoshone, Beaver Creek, Big Horn, Rattlesnake, Seminoe, and Laramie Ranges, and indications appear to show that this belt extends to the coal measures east of Fort Fetterman.

North of this belt, along the Powder River and its tributaries, in Johnson and Crook counties, other oil indications appear, although their extent and character have not yet been thoroughly enough explored to define their limits. However, the oil appears at the surface, near the mouth of Willow Creek, on Salt Creek, and at other points along this water-course. It also appears at the surface at points along the Belle Fourche and tributaries farther eastward.

Passing from the northern and central oil belts of the State to its southwestern corner, oil indications appear near Aspen, some 10 or 15 miles southeast from Evanston, on the Union Pacific Railway, and near Bridger, farther northwestward. These indications are in the form of saturated rocks, and oil escapes from the surface. However, this region has not been sufficiently surveyed to ascertain its extent and character.

As the prevailing scientific theory indicates that petroleum is the product of coal, or is at least found within its measures, it must follow that the oil belt which appears near Aspen must extend eastward as far as the Laramie Range, or as far as the coal measures of Southern Wyoming extend. The greatest oil region of this State, thus far discovered, is its central belt.

The quantity of oil stored in the natural reservoirs of Wyoming is incalculable, and the amount already known to be available—awaiting the necessary appliances to utilize it—is also very great. Compared with the coal fields of Pennsylvania and elsewhere eastward, Wyoming, in extent of known oil territory, and thickness and area of oil-producing surfaces, excels them all, as shown by the latest scientific and practical investigations and tests.

The chemical tests of Wyoming oils show that they are both illuminating and lubricating in character, the latter being the most valuable, and not, to any considerable extent, found in the Pennsylvania oil fields. The lubricating qualities of oil found in this State have been tested by the ablest chemists of this country and Europe, and by both pronounced the best lubricants yet found in any country. Mr. Taylor, the chemist of the celebrated Standard Oil Company at Cleveland, Ohio, in reply to questions submitted to him by Professor Aughey, late geologist of Wyoming, concerning certain oils of this State, specially says:—

"In answer to your inquiries, I will say that the Beaver oil brought to 28 gravity (Baume), with the Seminoe oil, would make a splendid axle oil; but unless the Beaver develops in very large quantity, I would not advise you to use it as basis for axle oil, but to use the Rattlesnake oil instead. The Beaver is the best natural oil for cylinder stock that I ever saw. It has a margin of 10 or 12 degrees of gravity over the best cylinder stock made in the East. By filtration the gravity becomes lighter, but I am of the opinion that the lightest colored filtered Beaver would be heavier than the heaviest unfiltered Eastern oil."

Probably there is no scientific expert in this country whose practical experience and thorough knowledge concerning oils is superior to that of Mr. Taylor, long thus connected with the greatest petroleum oil company on the globe. It certainly ought to be conclusive.

But here is another high testimony which fully sustains Mr. Taylor. Messrs. Wyner & Harland, public analysts of London, England, to whom were submitted specimens of the Beaver and Seminoe Basin oils, made an analysis of them as to their lubricating qualities, as follows:—

Specific gravity, .966.	
Volatile below 650° F.:	
Lubricating oil, specific gravity, .842 to .847; flashing at 110° F	19.00
Volatile above 650° F., to a red heat:	
Lubricating oil, specific gravity. .926 to .995; flashing at 314° F	45.00
Lubricating oil, specific gravity, .957; flashing at 324° F	12.50
Coke	14.50
Ash	a trace
Lost by volatilization and decomposition	9.00
	100.00

These oils were mixed and tested for lubricating power. The mixture showed: Specific gravity, .919; flashing point, 115° F. Submitted to a cold test considerably below zero (centigrade), showed no signs of solidification. * * * When properly treated by distillation, the product obtained would form lubricating oils equal, if not superior, to the best vegetable or animal lubricants.

Among the other practical tests of the flow of oil in this State was that of Dr. Graff and others, of Omaha, who established a boring plant in the Shoshone Basin in 1884, and at the depth of 350 feet they struck a flow of 80 barrels of oil per day. This illustrates other basins of this great central belt of Wyoming.

The properties of the oil in this basin, as shown by the analysis of the Territorial geologist, are as follows:—

Naphtha	.63
Kerosene	47.00
Lubricating oil, neutral and light colored	32.00
Coke	12.00

In its crude state as it flows from the springs or surface, it has a gravity of 20° in the Baume scale; its flash test is 294°, fire test 322°, and cold test 16° below zero. It will be observed from the above that it can be utilized either for kerosene or for lubricating oil, or for both.

By a method of practical distillation, practiced by Messrs. Wyner & Harland, they obtain the following result:—

Kerosene, gravity .807; flashing point, 110° F	17.00
Lubricating oil, .810 to .824	21.00
Lubricating oil, .840 to .844	20.00
Lubricating oil, .906	27.00
Coke	14.00
	99.00

The above result proves this to be an exceedingly valuable oil for the production of kerosene, and a superior lubricating oil.

This oil was for some time, says the geologist, used for lubricating car-wheels by the Union Pacific Railway Company, and proved satisfactory.

The same English analysts certify, in an analysis of the Rattlesnake Basin oil, thus:—

Specific gravity, .662.

Submitted to practical distillation, it gave kerosene	none.
Volatile, 600° F:	
Lubricating oil, specific gravity, .854 to .860; flashing point, 150° F	29.80
Volatile, 650° F., red heat:	
Lubricating oil, specific gravity, .933; flashing point, 570° F	7.40
Lubricating oil, specific gravity, .950; flashing point, 306° F	23.00
Coke	30.00
Loss in distillation, decomposition, etc.	9.80
	100.00

A portion of the oils mixed together and tested for lubricating have. Specific gravity .900; flashing point, 100° F

This oil is valuable on account of the hydro-carbon, which can be obtained from it by distillation, by far the most important being the heavy lubricating oil of specific gravity of .950. This oil distills only at a very high temperature, considerably above the range of a mercurial thermometer, and this, taken in conjunction with the high specific gravity, should render it an exceedingly valuable lubricant for heavy machinery. It is not altered and shows no signs of solidifying when submitted to many degrees below zero (centigrade).

WYNER & HARLAND.

Thus it will be observed that Wyoming is destined soon to become the great oil field of the world, in variety, quality, and quantity. The test thus applied to the Shoshone, Beaver, and Rattlesnake basins, will apply to a great extent to the other basins of this great central belt, except to their lubricating qualities, they being more of an illuminating character.

Movements, backed by ample capital, are already on foot, in view of the vast known oil resources of Wyoming, to establish pipe lines and rectifying or refining works at several points.

MINERAL WATERS.

The variety, quantity and quality of the mineral waters of the State are most remarkable. The State geologist says:—

"Wyoming is pre-eminent for her mineral springs. If we take into our estimate the Yellowstone Park, it surpasses the rest of the world in the number and the magnificence of her waters. Even after subtracting the National Park, this State leads all the States in this source of interest and wealth. The mineral springs range from extremely hot to extremely cold, and from simple sulphur and iron springs, containing these ingredients, to those containing these and all the alkaline earths. Even genuine mud springs exist in various parts of the State. The Shoshone basin is the most noted locality for mud springs. At Death Lake there are at least four hundred of them They extend from 50 feet above the lake basin down to the water's edge. They have found mounds from a few inches to 15 feet in height, and contain circular openings in the top, filled in part with muddy water, and in part with mud. This mud is fine silt and gelatinous earth. In some the mud and water remain mingled together as if stirred by human agency. In some instances the mud boils over the side of the bowl and flows for a short distance. Bubbles of gas are constantly escaping, and it is the commotion caused by its presence that keeps the mud in motion. Geyser-like eruptions are readily produced by firing rifle balls vertically down into the openings. Mud then flies from 6 to 15 feet into the air.

"HOT SPRINGS.—A famous hot spring is located 2 miles west of Fort Washakie, on the Shoshone Reservation. It is is oval shape, and is 320 feet long, and 250 feet broad. Its average temperature is 149° F. The minerals held in solution are medicinal, and many white people go there, as the Indians did before them, for treatment.

"Another large hot spring occurs just south of Sheep Mountain, in Beaver Cañon. It contains sulphur in solution and other ingredients. The temperature of the water is 90° F. Near by are cold mineral springs, which contain in solution soda, sulphur, iron compounds, sulphureted hydrogen gases, and carbonic acid Here are all the varieties of hot and mineral waters necessary for a great health resort.

"One of the sulphur springs on Big Horn River has a temperature of 94°.

"On the Wind River, northeast of Union Pass, there is a hot spring with a temperature of 97° F.

"The temperature of the hot spring on Snake River, below the mouth of Hoback, is 117° F.

"A spring with a temperature of 108° is located 10 miles below Fort Laramie. There are numerous hot springs on the Sweetwater, but their temperature has not been ascertained.

"A large hot spring exists at the head of West Horse Creek, whose temperature is 104° F.

"A spring with a temperature of 98° F. exists on the east end of Seminole Mountain in the Platte Cañon.

"At the base of the Medicine Bow Mountains, in the valley of the Platte, is an extensive group of hot and mineral springs, which have been extensively improved and are becoming annually more and more a place of resort for invalids. The waters contain sulphur, alkaline salts, and some, in addition, the salts of iron.

"COLD MINERAL SPRINGS.—Some of these have already been referred to and their number is legion. The large number of soda lakes is an illustration of their character. They are discussed in another connection, and are here passed by.

"Near Rawlins are mineral springs that come out from a stratum of blue limestone and have an abundant flow.

"At Evanston are a series of mineral springs of a similar character.

"North of the Rattlesnake Mountains, along and at the source of the streams that form the headwaters of the South Powder, are a large number of sulphur springs, of which I have visited and examined at least twelve. They contain sulphur in solution and also sulphureted hydrogen gas. Some of them also contain salts of iron. On the Poison Spider, from Garfield Mountain to its mouth, are a large number of sulphur springs.

"Along Salt Creek occur a large number of salt springs, which also contain sulphate of soda (Gauber salts) in solution.

"Several pure salt springs also occur on Salt Creek, which flows into the South Powder above the mouth of Willow Creek.

"Mineral springs—sulphur, soda, and iron—occur more or less abundantly in all the mountain ranges, such as the Laramie, Big Horn, Sho shone, Teton, Wind River, Bear River, Medicine Bow, and Sierra Madre ranges. Their very abundance causes them to be little observed. A volume would be required to enumerate them, give their different characters, and recount their merits and value. A large part of the mountain ranges yet partake slightly of the characteristics of the Yellowstone Park; namely, prodigious chemical reactions going on beneath the surface of the earth. These reactions make themselves apparent in the hot and mineral springs that abound."

TAXABLE PROPERTY.

The increase of wealth in Wyoming is shown by an examination of the assessment rolls since the organization of the Territory. These statements do not represent more than one-third of the actual valuation of the property assessed, and probably not more than one-quarter of the actual value of property; but they represent a uniform assessment of value from year to year, and therefore afford a correct basis of comparison. The total assessed valuation of all property in 1870 was $6,924,357. In 1880 it had increased to $11,857,344; and in 1888, to $33,338,549. A depreciation of over $5,000,000 from 1886 to 1888 in the assessment list of live-stock was made up in the increase of other property. Notwithstanding the heavy losses in live-stock interests, the total Territorial valuation has steadily increased. The assessment in 1889 of $6,163,336.50 on railroad property is almost equal to the entire valuation of property in Wyoming in 1870. The low rate of assessment is apparent when it is stated that the total railroad equipment in Wyoming has cost, according to competent authorities, not less than $35,000,000, and is assessed at less than one-fifth of that sum. Other property is not assessed as low accordingly, but it is safe to estimate the wealth of Wyoming at $100,000,000, or about three times its assessed valuation.

The financial affairs of Wyoming have been well managed, and the credit of the State stands high. The Territorial bonds, which bear 6 per cent annual interest, sold at an average premium of 12 per cent.

Wyoming had, September 1, 1890, a cash balance in the Treasury of $94,914,02. The Territory bequeathed to the State a bonded indebtedness of $320,000; these bonds bear 6 per cent interest.

The following shows the increase in lands passing into the hands of owners and becoming taxable:—

ACRES OF LAND ASSESSED, EXCLUSIVE OF TOWN PROPERTY.

County.	1886.	1889.	County.	1886.	1889.
Albany	70,506	955,866	Laramie.	180,637	915,140
Carbon	35,864	1,201,627	Sheridan	....	63,480
Converse	....	51,317	Sweetwater	12,308	1,800,000
Crook	21,739	91,802	Uinta	23,102	679,004
Fremont	8,292	31,914			
Johnson	42,311	78,220	Total	394,789	5,868,370

The following statement shows the assessed valuation of property in Wyoming Territory from 1870 to 1890, inclusive:—

TOTAL ASSESSED VALUATION.

Years.	Total valuation.	Years.	Total valuation.
1870	$ 6,924,357	1880	$11,857,344
1871	7,018,531	1881	13,987,675
1872	7,591,846	1882	17,746,627
1873	7,594,722	1883	22,962,545
1874	8,147,902	1884	26,308,620
1875	9,493,688	1885	30,717,249
1876	9,674,576	1886	31,020,784
1877	10,098,689	1887	32,089,613
1878	11,606,339	1888	*33,338,541
1879	12,354,812	1889	31,431,495
		1890	30,665,499

* An error in double assessment afterward reduced the figures given in the above statement for 1888.

INTEREST RATES.

	Per cent.
Legal rate of interest on public indebtedness	8
Legal rate of interest on all other indebtedness when no contract is made	12
Bank loans on short time	12
Real-estate loans, one year	7 to 12
Real-estate loans, two or more years	7 to 10
Interest paid on bank deposits	6 to 8
Interest on Territorial bonds	6
Interest on municipal and school bonds (A few of the first issued bonds of this character carry 7 and 8 per cent.)	6
Interest on city, county, or Territorial warrants	8
Interest on long loans, well secured	6

Judgments draw 12 per cent, book accounts draw, after thirty days from date of last item purchased, 12 per cent. Any rate of interest agreed upon in contract is legal.

SETTLEMENT OF LANDS.

Governor Francis E. Warren in his admirable report for 1889 to the Secretary of the Interior says:—

"The total number of acres of land in Wyoming is 62,645,120, of which 47,496,141 acres have been surveyed. There remain unsurveyed 15,548,979 acres, or about one-quarter of the total area.

"Land matters in this Territory were seriously hampered for several years by the withholding of patents and the disposition of those in authority to regard with suspicion the men who were trying to settle and make habitable the public domain, to push ahead land and ditch surveys and other necessary work. This policy has seriously retarded the development of the country; but the recent action of the General Land Department in issuing numerous patents a long time wrongfully withheld has greatly improved the condition of things.

"The number of acres of public lands disposed of in Wyoming for cash and under the homestead and timber-culture acts, located with agricultural college and other kinds of scrip, located with military bounty land-warrants, and selected by the Territory and by railroads, aside from Union Pacific Railway land grant, is as follows:—

Year.	Acres.	Year.	Acres.
1876	7,487.42	1884	596,786.88
1877	5,156.00	1885	552,967 14
1878	23,333.67	1886	453,572.51
1879	33,330.64	1887	424,780.20
1880	44,146.83	1888	242,306.78
1881	48,955.92	1889	301,375.51
1882	58,307.25		
1883	187,488.65	Total	2,978,995.40

"The above does not include lands disposed of prior to 1876, of which some 5,000,000 acres were Union Pacific Railway subsidy lands, now largely disposed of and occupied by private owners.

"The Union Pacific Company, however, still own 2,638,500 acres of land, which is excellent for grazing purposes. Its soil produces a native grass that is noted for its nutritiousness and fattening quality for stock. Cattle ranging upon this land become fat and in good condition for the market without the expense of grain feeding. Prices range from $1.00 to $2.00 per acre, according to quality of soil and location.

"From the above figures it will be seen that there are many million acres of Wyoming lands open for settlement under homestead, pre-emption, and other privileges, and the field is rich for the emigrant desiring a new country and early privileges in the selection of lands.

"United States land offces are located at Cheyenne, Buffalo, and Evanston."

UNITED STATES PUBLIC-LAND LAWS.

The following information concerning the public-land laws will be useful to those desiring knowledge on the subject:—

All lands which are for sale or other disposal by the Government under general laws are known as public lands, and are divided into land districts, in each of which is a land office presided over by two officers, known respectively as the register and receiver.

There are three of these land districts in this State.

The register and receiver act as agents for the Government, and patents will be issued for all land sold or otherwise disposed of by them, if approved by the Commissioner of the General Land Office, Washington, D. C.

Agricultural lands are disposed of to actual settlers only under the homestead, pre-emption, and timber-culture laws.

Desert lands are such as will not produce crops without irrigation by artificial means.

Within the limits of railroad grants only the even-numbered sections are disposed of by the Government, and these are known as *double-minimum* land, and when entered under the pre-emption law the price is $2.50 per acre.

Outside the railroad limits the land is known as *minimum* land, and is sold at $1.25 per acre.

Citizenship is required, or a declaration to become a citizen of the United States, before any public lands can be taken in this State.

Only one claim can be taken by the same person under each of the public-land laws of the United States.

THE HOMESTEAD LAW.

Every citizen of the United States who is over twenty-one years of age or the head of a family, can take 160 acres of the public lands (agricultural) by establishing a residence thereon and cultivating the same in good faith as a home for five years from the date of settlement; or if, after six months' residence and cultivation, such persons so desire, they may commute their homestead claim by paying the Government price therefor; or, if a soldier or sailor in the Army or Navy of the United States during the recent rebellion, and honorably discharged, the time of his service will be deducted from the five years' residence required. But in such cases a residence of one year on the land becomes necessary before patent will be issued.

THE PRE-EMPTION LAW.

Residence, cultivation, and sufficient improvements to show the good faith of the claimant are required.

One hundred and sixty acres can be taken of agricultural land; qualification as to age and citizenship is the same as under the homestead law. The claimant must not be the owner of 320 acres of land, nor leave land of his own in this State (town lot excepted) in order to settle upon a pre-emption claim, nor take such claim for the purpose of speculation instead of residence and cultivation.

The good faith of every claimant must be clearly established.

He may change his pre-emption filing to a homestead by making proper application to the land office. Not less than six months' residence and improvement are required by law before payment can be made.

On *offered* lands the declaratory statement must be filed within thirty days, and the final proof made within one year from the date of settlement. On *unoffered* lands the declaratory statement must be filed within three months, and the final proof made within thirty-three months from the date of settlement.

The price for minimum land is $1.25, and for double-minimum land $2.50, per acre.

TIMBER-CULTURE LAW.

Qualifications of claimant the same as to age, citizenship, and good faith.

Amount of land, 160 acres. Land must be devoid of timber. During the first year at least 5 acres must be plowed. The second year said 5 acres must be actually cultivated to crop, and a second 5 acres plowed. The third year the first 5 acres must be planted in timber, seeds, or cuttings, and the second 5 acres actually cultivated to crop. The fourth year the second 5 acres must be planted in timber, seeds, or cuttings, making at the end of the fourth year 10 acres thus planted.

If the claim is less than 160 acres, the area plowed and planted will be in the same proportion as for 160 acres; that is, one-sixteenth of the claim. Not less than 2,700 trees must be planted on each acre, and there must be at least 675 living trees on each acre to entitle the claimant to patent at the expiration of eight years from date of entry.

Residence in the State is not required for timber culture.

COAL LAND LAWS.

Same qualifications as to age and citizenship.

One person can purchase 160 acres of coal land. If within 15 miles of a completed railroad the price is $20 per acre; if outside of that distance, $10. An association of persons may purchase 320 acres, or an association of not less than four persons, who make an expenditure of $5,000 upon their claim, may purchase 640 acres, including their improvements.

Coal-land declaratory statements must be filed within 60 days, and proof and payment made within one year from date of possession.

MINING LAWS.

The mining laws of Wyoming are similar to those of other mining States and Territories.

DESERT-LAND LAW.

Any person, a citizen or one who has declared his intentions, twenty-one years of age, can file on 640 acres in compact form, not longer than 1¼ miles, by paying 25 cents an acre at filing, proving up within three years (and paying $1 more) by conveying water on it, cultivating a hay or other crop, and reclaiming it from its desert character, and is entitled, upon proof, to obtain a patent for it.

A declaration is made by the party, with two witnesses, of desert and non-mineral character, sworn to before land office or clerk of court record. Can be filed on unsurveyed land. They are not assignable. No fees to officers. Final proof must show cultivation and reclamation. Copy of declaration of intention must accompany final proof; also record proof of water right, if any.

If the three years' limitation has expired, affidavits must be made with satisfactory reasons for delay before final proof. If the time passes by and the claim is contested, it is lost.

Residence in the State is not required in desert entries, nor is the applicant obliged to appear at the land office when filing or at proof, but witnesses must be present.

COMMERCE AND THE PROGRESS OF RAILROAD ENTERPRISES.

Wyoming is without navigable rivers to give an outlet to the product of its mines, farms, and stock ranges, and its commerce must depend upon the extension of railroads.

The State has, however, some six hundred rivers and creeks, from which water is taken for irrigation, and there are numerous streams that have not been used for that purpose. All these streams furnish good grades for railroad building.

The contour of the State is such that streams heading near the tops of the mountains flow in almost every direction. On account of the ascending grades along streams on one side of the mountains, and others descending on the opposite side, it requires at the top of mountains or divides little heavy work or tunneling in railroad building to cross the ranges. Railroads, in most instances, can be constructed in any direction, and easy crossings made of divides, notwithstanding the general appearance of a section may seem exceedingly mountainous.

RAILROADS.—The following shows the total number of miles of main lines of railroad operated in Wyoming on June 30, 1889:—

	Miles.
Union Pacific Railway Company	489
Oregon Short Line	93
Denver Pacific	10
Laramie, North Park and Pacific	13
Cheyenne and Northern	125
Wyoming Central (Northwestern)	130
Cheyenne and Burlington	29
Total	889

Regarding the Union Pacific Railway, Governor Warren makes the following emphatic remarks:—

"The completion of the Union Pacific in 1868 opened Wyoming to settlement. Without the construction of a transcontinental railroad, the Territory would have remained uninhabited except by savages and wild game for many years.

"The completion of the main line of the Union Pacific Railway resulted in opening up and stimulating the development of the agricultural and mineral resources of the vast territory which it traversed. Local traffic sprang up along the line of the road, and promoted the construction of branch lines as feeders to the main. A few feeders only have been built, but others are necessary, and also the further extension of those already commenced. The Union Pacific needs branch lines to foster and protect its local traffic and to furnish business for its system, and the country requires more railroads to promote its occupancy and settlement.

"The operations of the Union Pacific are said to be seriously embarrassed by the unsatisfactory relations existing between the Government and the railway company, and the inhabitants of this country are the sufferers because of the lack of necessary railroad development. Congress should arrange a speedy settlement, and one that would admit of the Union Pacific being granted the right to build branch lines in self-protection, without which the main line must become like the trunk of a tree—without roots or branches—in its relation to the greater portion of the territory naturally tributary to the Union Pacific."

The Cheyenne and Northern division of the Union Pacific runs from Cheyenne in a northeasterly direction for 125 miles. At Cheyenne the

Cheyenne and Northern connects with the Denver Pacific, and that, with other connections, forms a southeasterly and northwesterly line, extending now from Texas and Mexico through Cheyenne to the North Platte River. When finished, it will cross the entire width of the United States to the British Possessions, intersecting all the transcontinental lines running east and west.

AGRICULTURAL DEVELOPMENT.

Wyoming is rich in agricultural possibilities, and increased attention is being given farming in all its branches.

In the eastern and northern portions and in some other localities good crops are raised without irrigation, and the area over which this can be successfully done is doubtless widening, but irrigation wherever applied greatly assists, and over a large portion of the State is absolutely indispensable.

Surface.—The lands are generally slightly rolling, very accessible, easily broken to plow, and quite free from stones or other obstructions.

The Soil.—In the valleys the soil is generally a black loam, in some places a red gypsum, and on the benches, plateaus, and slopes, a sandy loam, usually rich and warm. A great portion of the State which looks blank and barren is an alkali soil which produces abundantly after being reduced by the application of water, especially the sage-brush and greasewood wastes.

Climate.—Wherever the altitude is less than 7,500 feet the climate is sufficiently mild and warm to develop crops usually grown in the Northern and Western States.

Crops.—Tame grasses, alfalfa, clover, wheat, oats, barley, rye, some corn, potatoes, roots generally, melons, and all garden vegetables, berries, small fruits, etc., are being successfully and very generally grown; immense crops of hay are gathered, and broom-corn, sorghum, and standard apples of excellent growth and quality have been grown and exhibited at our State and county fairs. The vegetables and grains shown at these fairs are unsurpassed in yield per acre or in size.

New agricultural districts are constantly being brought to public notice. One of the most complete and creditable exhibits displayed at the last Territorial fair came from Salt River Valley. The product was not only grown upon *public* land, but upon *unsurveyed* land.

Markets.—Wyoming should furnish within herself the best markets obtainable for all kinds of agricultural crops. Her mining and stock interests employ many thousand men, her cities and towns will continue to be constant consumers. Stock-raising and farming combined are very successful.

Irrigation.—In view of the facts that more than one-half of the people of the world reside where irrigation is essential in the production of agricultural crops; that one acre cultivated under irrigation yields as much as 3 to 5 acres in countries cultivated without irrigation; and that in some countries irrigation is resorted to as a source of fertilization where there is sufficient rain-fall, and additional water not necessary, it is very plain we cannot overestimate the importance of this art or the value of water when used for purposes of irrigation.

The success which has attended irrigated farming in the arid region of the United States, and the growing importance of our agricultural interests, have attracted much attention. The extension of the irrigated territory, and the immense extent of country to be reclaimed by the practice of this art, makes it of importance not only to the arid regions but to the whole nation, that there be a wide dissemination of available information on this subject.

The great results in individual size and in general yield of crops grown are always reached by the intelligent application of water. Irrigation is more reliable than rain-fall in the production of crops, as the farmer can regulate the moisture according to the necessities of each crop and the soil he wishes to treat. Oats raised in this manner weigh from 38 to 48 pounds to the bushel, where 32 pounds is regarded the regular standard without irrigation; in other crops a similar result is given. Farmers who become accustomed to irrigation seldom return to farming in localities where irrigation is not practiced.

The water supplies are reliable, as they have their source high up in the hills or mountains where living springs abound, and where in most cases the snows of winter are melted during the entire summer.

The water coming down from the mountains and higher plateaus is freighted with fertilizing materials derived from the decaying vegetation and soils of these upper regions, which are spread by the flowing of water over cultivated lands. Reservoirs can be made in the many natural depressions or basins by storing the surplus water during the year, so that small streams used in this way will irrigate large tracts of land.

Wyoming lies almost wholly within the limit of the arid belt, and successful agriculture is largely dependent upon irrigation. This is not so much due to insufficient rain or snow-fall as to its unequal distribution. If the moisture of the atmosphere were precipitated uniformly over all the State, it is possible that irrigation could be dispensed with, but such is not the case. The high mountains, owing to the cold atmosphere, act as great condensers, and clouds in passing over them are robbed of their moisture, leaving but little for the plains below. An area equal to about one-third of the State is included in the lofty ranges which form the culmination of the watersheds of the streams.

There is an unfortunate lack of statistics of the annual amount of precipitation on this region, but from the best available data the average precipitation equals a layer of water over the entire area from 2 to 3 feet in depth. The greater part of this falls as snow, which melts and passes off during the spring and summer months.

The lands adapted to agriculture vary in elevation from 3,000 to 7,500 feet. Between these elevations is situated nearly two-thirds of the State with an average rain-fall of nearly 12 inches. The range at Cheyenne for a period of seventeen years is about 14 inches, the minimum being 5.03 inches in 1876, and the maximum 19.24 inches in 1883. The greatest known rain-fall within the agricultural limits of the State is 31.42 inches at Fort Laramie, in 1853. This point has also the minimum record, 2.38 inches in 1860. The experiments of the State engineer and the observation of the most experienced irrigators fixed the average depth of water which must be added to the rain-fall by irrigation, to secure the *greatest* yield, at 2 feet, this being equivalent to a duty of 1 cubic foot per second for 80 acres, reckoning the irrigating season at one hundred days.

We have, therefore, in this State the following conditions: There are over 20,000,000 acres of mountains on which water falls each year to a depth of 3 feet. There is an equal or greater area of land so situated along the streams as to be susceptible of irrigation, and they have the requisite smoothness and slope of surface to permit this to be readily accomplished. The problem of irrigation is to supplement the work of nature and distribute the water falling on the high mountains over these lands. It is not known how great a portion of the water falling on the mountains is lost through evaporation and sinking into under-ground channels, but two-thirds seems a liberal allowance for these losses, which leaves 20,000,000 acre-feet available for irrigation, and this on the duty before mentioned would suffice for the reclaiming of over 10,000,000 acres. To reach this result, however, it will be necessary to store up water which now escapes during the winter months and during the early spring floods.

Wyoming differs from nearly all its neighbors of the arid region in the fact that its settlement and development are not the result of mining excitements and discoveries. The chief occupation of her people has been, and is yet, the care and management of the grazing and farming interests. To this fact is due the surprising agricultural development which has taken place within the past decade. Handicapped as the State has been by the lack of transportation facilities, the enormous expenditure involved in the construction of irrigation works would not have been met save through the proceeds of the cattle business and the necessity arising therefrom for a winter food-supply for the weaker stock.

As it now stands, Wyoming, although the youngest State in the Union, is third in the area of irrigated land and second in the number and mileage of its irrigation canals. A summary of the number, mileage, and capacity of the ditches of the State in the different water districts, and the area of land watered therefrom, is given below, being compiled from the records in the office of the State engineer:—

STATISTICS.

Number of streams from which water is diverted for irrigation		600
Number of water districts		10
Number of recorded ditches (there are believed to be unrecorded at least 500)		2,613
Total length as stated	miles	4,508
Total number of claims where length is not stated		390
Total capacity as given	cubic feet per second	23,100
Number of ditch-claims no capacity given		506
Total acreage given as attempted to be watered		2,002,736
Number ditch-claims no acreage given		623

This table does not include the irrigation statistics of the fourth water district, which are not completed. As it stands, however, it shows an area of farming land greater than the average of the New England States, and an irrigated territory equal to one-half that of Italy and greater than that of France and Spain combined. It is an extraordinary record, when it is remembered that it is largely the work of the past ten years under unfavorable conditions; and it should forever put at rest any doubt as to the ultimate greatness and wealth of Wyoming. If the pioneers of this work can, unaided, produce such results, what may not be accomplished through the intervention of ample capital, or with State or national aid.

EXPENSE OF RECLAIMING LAND.—A short time previous to the late visit of the United States Senate Committee on Irrigation to Wyoming a circular letter, together with a series of questions to be answered, was sent from the Territorial engineer's office to farmers of known intelligence and practical experience in irrigation in different sections of the Territory, asking their views on some of the questions involved in this investigation. The answers are from representative farmers living in every county in the Territory. The letter and questions, together with a synopsis of the replies, are given, as showing the results of actual experience in irrigation development and the views of unbiased and experienced men as to some of the questions on which legislation is proposed.

Name, ...; county, ...; postoffice, ...

1. How long have you resided in the Territory? ....

2. In what year did you begin farming? ....

3. How much land have you under ditch? ....

4. If obtained from the Government, state the filings which were made? ....

5. How many acres are now under cultivation? ....

6. By what ditch or ditches is it watered? ....

7. From what stream or streams is water taken? ....

8. Give history of construction of ditch:

(a) Name of owners, ...
(b) Date begun and time occupied in building? ....
(c) Dimensions, ...; length, miles ....; depth, ...; width, ...
(d) How many acres does it water? ....
(e) What was the cost of construction? ....
(f) What is the cost per year for management and repairs? ....

9. Do you buy or sell water? If so, state price paid or received. ....

10. Have you all the water needed? If not, state the reason. .... ..

11. What is the usual cost of bringing wild land under cultivation? This to include plowing, grubbing sage brush, fencing, etc. ....

12. How many years' cultivation are required to bring wild land into proper condition for farming? ....

13. What did it cost you to prove up and obtain title to your land, and what was the length of time required? If any difficulties were encountered, state what they were. ....

14. What has your cultivated land cost you per acre? This is to include cost of proving up, cost of ditches and laterals, expense of preparing land for cultivation, fencing, and all permanent improvements. . . ....

15. What is its present market value per acre? ....

16. Can you raise crops without irrigation? If so, state what they are and yields obtained. ....

17. Do you think the present land laws are adapted to the conditions of this Territory? If not, what changes would you suggest? ....

18. What should be done with grazing land which cannot be irrigated? What is its value per acre? ....

19. How do you regard the withdrawal of all public land from settlement during the irrigation survey? ....

20. Do you favor the donation of all irrigable public land to the Territory? ....

Respectfully, ELWOOD MEAD.

NOTE.—Should the spaces left be insufficient to write reply, write on the accompanying sheet.

From the statements in answer to question 8 (*c*), the average cost of bringing water over the land was $4.50 per acre, the highest cost reported being $12.50 and the least $1.50 per acre. This variation is due to the difference in the price of labor and material in different sections and to favorable natural conditions or the reverse. The average cost of this work is believed to be near the general average for all the work now completed. The building of large canals to water greater areas would secure the same result at much less expense, and the tendency now is to construct works of this character.

The average cost of bringing wild land under cultivation, as stated in reply to question 11, was about $10 per acre, twenty-one replies ranging from $5 to $10, four from $10 to $15, and three above $15; two gave no estimates. This is exclusive of the cost of distributing works for water. Together they serve to illustrate the expenses incident to the reclamation of the arid domain under the methods and conditions heretofore prevailing.

GREAT WEALTH.—From these statements and the evidence of others well informed on this subject, the expense of constructing ditches and distributing works of this State does not fall short of $5 per acre, making the total investment in irrigation works in the State at the present time about $10,000,000, upon which no taxes are assessed, demanded, or paid. The improvements on the land thus watered, together with the outlay made in bringing land in proper conditions for farming, must be nearly as great, so that the total expenditure at present in irrigation works and agricultural improvements is considerably in excess of $15,000,000, the land itself being taxed only.

The cost of making proof of settlement or reclamation of land was variously stated from $1 to $5 per acre. Fourteen answers gave from $2 to $5, and in two cases of contests it exceeded the latter sum. With the limited number of land offices the cost of making proof of the reclamation of desert lands has in many cases proven a serious and unlooked for expense to our pioneer farmers, and when this was followed up by the arbitrary withholding of patents that deprived the settler of any security on which to borrow money, the evil was aggravated.

All replies agree in stating that irrigation is necessary to secure the largest yields in agriculture, and all are agreed in commending the operation of the desert land law, a number adding the statement that reclaiming the land should of itself entitle the settler to possession without the additional payment of money. Opinions as to the proper disposal of grazing lands vary, the majority favoring such action as will enable it to be used in connection with the farming lands along the streams. All favor the donation of the agricultural lands to the State, if the State will secure reclamation, for the reason that experience has shown the desirability of having both the land and the water under one control if we are to have the fullest utilization of the water supply.

LIVE STOCK.

Governor Warren said upon this subject:—

"The greater portion of Wyoming is admirably adapted to the live-stock industry. Nutritious grasses that cure standing on the ground furnished good grazing both in winter and summer. The great grain-growing States of Nebraska and Kansas are directly on the route of shipment to market, so that live-stock bred and reared on the ranges can be fattened and finished in the cheapest grain country in the world while en route to points of sale.

"The Territory employs a competent veterinarian to prevent the spread of contagious diseases among cattle, sheep, and horses; but with the exception of glanders, which is easily stamped out, fatal contagious diseases do not exist. Laws are rigidly enforced for the prevention and extinguishment of disease and to generally protect this great industry.

"Previous to 1870 the live-stock industry was of little consequence in Wyoming, and included work stock, milch cows, with perhaps a few bunches of cattle and sheep held by the meat markets for daily slaughter. It was then believed by stockmen, who grazed their herds on the plains south of Wyoming, that the winters were too severe to admit of safely grazing cattle, horses, and sheep on the open range during the entire year, and the occupancy of the large portion of the Territory by Indians at the time deterred the experiment of stock raising.

"CATTLE.—In 1870 and 1871 several lots of cattle were brought north from Colorado and Texas. It was found that they wintered well, and the succeeding year witnessed the driving in of very large herds from the south and southwest. The Indians having retired, the full possibilities of grazing live-stock in the Territory commenced to draw upon the herdsmen.

"Disease was unknown, the grass grew abundantly, cured excellently, and carried through the winter all classes of live-stock without having to furnish any considerable amount of hay or grain. The transcontinental railway afforded quick transportation eastward, and the freight rates were low compared with the tariff charged on other commodities. As the business grew, immense profits were realized; capital came in from all parts of the East and the Old World, and the statement that all a man required in Wyoming to become rich was to own cattle, was rarely disputed. The Wyoming Stock-Growers' Association, a protective organization, was formed, and the general success of the business was most remarkable. Prices for cattle products rose very rapidly at the Eastern markets for several years, and it became an accepted theory that the population of this country was increasing much faster than horned cattle. The rise in prices of live-stock was maintained, and their numbers increased in Wyoming for more than ten years after the first herds were driven here. Immense numbers of cattle were brought in, breeding herds established, good blood introduced, the animals improved, and, indeed, to many there seemed to be no limit to the success and prosperity of the business.

"In 1884 and 1885 there was believed to be 2,000,000 head of cattle in Wyoming, worth, on an average, $30 per head. The business was still very profitable, but the prices for beef in the Eastern market showed severe decline—a decline that has continued with slight variation until the present. Although the grade of cattle has greatly improved, the price per head has depreciated from 25 to 50 per cent. During the early period mentioned the prevailing transactions of stock cattle were made on book tally without delivery, and immense herds were built up, the tendency being toward concentration—fewer herds of large size and a general looseness in the conducting of the business. This condition, with occasional severe winters, resulted in great losses to those who invested recklessly or were unfortunately located, and many cattle companies, built upon inflated values and uncertain numbers, collapsed.

"I quote the following from my report of 1885:—

"The business of cattle raising in this Territory can scarcely be longer regarded as in its infancy, nor can the business be called experimental or speculative as to its generalities.

"The rearing of cattle in the Territory is to-day as profitable as it ever was, but it has lost much of that speculative 'sell and buy without tally, anything and any price to get into the business' buoyancy that has characterized it.

"The prices of stock cattle have advanced to a figure where investors, while willing to pay current rates, want to know to a certainty that they are getting what they pay for, as to numbers, grade, and condition of the cattle. There is also a growing conviction that this business will not longer 'run itself,' and that the owners must give it, at least, some small percentage of the attention necessary to accomplish success in other industries, and there is also a prevailing disposition to better provide against emergencies, such as the putting up of hay for the weaker ones, the providing of shelter for thoroughbred and fine stock, the separation of bulls from the herd, and special care given them during the winter, etc.

"Perhaps the greatest reform is the determination on the part of the owners to discontinue the pernicious practice of shipping to market unripe beeves, but, instead, to ship only those of proper age and that are really fat, leaving the younger ones to grow longer on the range, and taking the older ones that are yet lean to the corn-fields of the Missouri Valley for fattening.

"Many of our large stock growers have already provided themselves with Eastern feeding grounds and have constructed suitable structures for fattening their beef.

"To give an idea of the increase and volume of the Wyoming cattle business, it may be stated that the Union Pacific delivered at Omaha 48,220 head of beef cattle in 1876, increased the number to 121,554 in 1883, and 166,000 in 1884. Since the period above mentioned cattle business in the Territory has changed quite a little. There are more herds, but of smaller size, and greater care is taken to provide shelter and feed for the weaker ones during the occasional storms of winter. The business, so far as the natural increase, healthfulness of stock, favorable winters, good ranges, etc., are concerned, is still very successful, but the extremely low markets prevailing the past two years for cattle products have been a discouraging feature.

"While it is claimed that the total number of head of cattle in the Territory has diminished, the following figures will give some idea of the magnitude of the business at present:—

"During the fall of 1888 and the spring of 1889, including the shipments of cattle for one year, there were inspected: Cattle *en route* to market at the several stock-yards, 343,054 head from Wyoming, with the exception of about 20 per cent of those inspected at the one point, St. Paul, which were from Montana and Dakota ranges. As but 102,000 were inspected at St. Paul, this would leave the number of Wyoming cattle inspected during that time upwards of 300,000 head.

"Good profits can be made in the cattle business of to-day, if properly conducted; and an encouraging feature of the business is that stockmen are adopting better modes of management. A reasonable increase in price of the cattle product, which is almost sure to come soon, will make cattle-raising in Wyoming one of the most lucrative industries known anywhere under the head of legitimate pursuits.

"The settlement of farmers and grangers upon agricultural lands has caused a division in the area of open country, but there yet remains a wide field for the business, conducted in the open-range way, on the very large tracts that can be used for grazing only for many years. The lands taken by settlers are being improved by irrigation, tilling, and fencing, so that the portion withdrawn from the public range will support more live-stock than before.

"While the contraction of the open ranges and the decrease in animals handled in the old way has necessarily lessened the cattle industry in Wyoming the last few years, yet it is believed that ultimately stock farming, or the combining of agriculture and stock-raising—crops being raised on the streams and live-stock ranging outside on mountain-sides and on the near ranges—will greatly increase the total number of cattle, and also the grade, weight, quality, and profits in the Territory, until there will be more cattle raised in Wyoming than at any time in the past, the total amount of grass, hay, and grain-growing having largely increased.

"Reports issued by the Department of Agriculture in Washington report the number of cattle in Wyoming to be: Milch cows, 8,323, average price, $36.75 per head; number of oxen and other cattle, 1,107,173, average price, $19.59. It is my opinion that the total number of cattle in Wyoming now will reach 1,500,000, head, the average price being, during the present great depression, about the same as quoted by the Agricultural Department.

"The present is a favorable time to invest in the cattle business in Wyoming Territory.

"SHEEP.—There are probably more than 1,250,000 sheep in Wyoming. The business was later in getting a start than cattle-raising, but is now far beyond the experimental stages, and established on a permanent and paying basis. The low price for wool during the tariff agitation has been discouraging, but confidence is returning with the friendly attitude of woolen manufactories and Congress regarding protective tariff, and there is a steady and growing market for mutton which is doing much for the future development of this industry.

"Sheep-husbandry in this Territory requires care and watchfulness to prevent loss from storms, disease, and accident; but with care all conditions are favorable. The only contagious disease is scab, and this is easily cured. The laws of Wyoming provide for county sheep-inspectors to prevent the spread of disease. Foot-rot is unknown; for the dryness of the soil acts as a preventive, and also speedily cures without the application of remedies when Eastern sheep are brought here affected with it.

"Sheep graze the year round; but when an occasional snow-fall is deep enough to prevent their reaching the ground, it is necessary to feed hay. On an average during the past ten years, not more than fifteen days of each year has it been necessary to feed hay or grain to strong, healthy sheep. The weaker animals require more nourishment; but in many instances they have done well without hay or other feed than that found on the open range, for several years in succession.

"Nearly all the grazing lands in Wyoming are adapted to sheep-growing. The sheep now raised are of good grade, and will yield an average per head throughout the flocks of 6 to 8 pounds of wool.

"GOATS.—There are perhaps 5,000 Angora goats and 1,000 or more common goats in Wyoming. The altitude being about the same as Asia Minor—the home of the Angora—this animal thrives well in the Territory. The mohair fleece brings a higher price per pound than wool, but the animals do not shear so heavily.

"MULES.—There seems no good reason why mules should not be extensively bred and raised in Wyoming. The few persons who have engaged in this business have been quite successful.

"SWINE.—Hogs are raised only for home consumption, but not in sufficient quantities, to supply the demand. This branch of stock-raising deserves more attention and will be found to yield good profits.

"HORSES.—The raising of horses in Wyoming is becoming a very profitable industry, and it is safe to estimate the number in the Territory at 150,000. No class of live stock is as hardy or as free from disease, and the percentage of loss is only nominal. When the snow is deepest horses will paw their way through it until the grass is reached; and in cases where the water is scarce and the distance many miles between streams, they find no difficulty in trotting out far enough from water to obtain fresh range. The pasturage furnishes all the necessary food for growing horses, and as they are able to graze closer to the ground than other live stock, an abundance of food is always assured.

"The number of horses in Wyoming is steadily increasing, and the quality being improved by careful breeding. Thoroughbred and standard-bred stallions, many of them imported, are being brought to the Territory in large numbers for breeding purposes. Wyoming race-horses have won laurels the past two years at home and abroad. Draft and driving horses are establishing excellent records in eastern cities, and the time is not far distant when Wyoming horses will be as famous as those of Kentucky, even surpassing them in lung development, sound feet, and power of endurance."

Mr. A. S. Mercer, of the *Northwestern Live Stock Journal*, a man thoroughly informed on the subject, says:—

"This section is the natural home of the horse, and here he is developed in a more perfect and uniform manner than anywhere else on the continent. The altitude and consequent rarity of the air develops a large and healthy lung; the dryness of the atmosphere protects against sudden changes of the thermometer; the sandy, dry, and hard character of the soil gives a foot (a hoof) as hard and durable as iron; the rolling and hilly character of the range over which the horses travel in search of food develops large and hard muscles, and the healthfulness of the climate gives the best of constitutions. In a word, the nature of the soil and the climatic conditions give wonderful lung capacity, sound feet and legs, with endurance and high courage. And these make the horse. Seventy-five to 90 miles are common drives for double teams in a day over our trackless prairies, with the common ranch horses. What we may reasonably expect from the young crop of improved animals now coming on is so far in advance of our past experience that we hardly dare to name it.

"It is safe to say that the time is not far distant when the horses of Wyoming will be as widely known and as generally appreciated as are the record-beaters of California and Kentucky of to-day. To the lover of the horse who contemplates entering into the business of raising good ones, there is no other spot in all the broad land offering greater inducements than our Territory. The wonderfully nutritive qualities of our native grasses give a development elsewhere only secured by the feeding of the best varieties of grains. All the conditions are favorable in the highest degree to the most perfect development of the horse.

"Long observation has shown beyond any question of doubt that different types of animals are produced by the continued operation of climatic influences. It is well known, for instance, that in low-lying countries, where the soil is wet, the atmosphere heavy with moisture, and the growth of vegetation is rapid, coarse, and rank, animals are produced of large frame, with loose, soft, flabby muscles, poor, flat feet and of weak lung-power. On the other hand, the opposite climatic conditions combine to produce a type of animals exactly the opposite of those just described; *i. e.*, one of compact build, with fine, clean bones, muscles of iron, great lung power, and constitutions that withstand the greatest strain of every-day wear and tear."

During the past year Wyoming horses have been shipped to many of the southern States for breeding purposes.

FISH CULTURE.

While most of the streams and lakes of Wyoming had a natural supply of trout and other food-fish, there were others entirely devoid of fish of any description, and the success attending the stocking of streams containing native fish as well as the barren waters of the State has been very gratifying. Under the fostering care of the Legislature, the fish hatchery at Laramie has been enabled to accomplish the most satisfactory results. The State is under obligation to the United States Fish Commissioner for frequent donations of valuable varieties of fish. Over a half million fish have been annually distributed in the streams of Wyoming for a number of years, and many streams that were barren have been stocked and found well adapted to the raising of trout and other superior fish. Trout planted in 1885 have been caught the present year that weighed from 3 to 4 pounds and measuring 20 inches in length each.

The fish hatchery under the direction of the commissioner made a large and very interesting exhibit at the Territorial fair in 1889, of fish grown in Wyoming streams that had been planted from the hatchery. The operations of the commissioner have been considerably curtailed on account of the withholding of appropriations for improvements that would double the capacity of the hatchery. The hatchery is on what is known as the abandoned Fort Sanders military reservation two miles south of Laramie, and, until title can be obtained to this land, the State is unwilling to make further appropriations.

Among the streams already stocked is the Big Laramie, which runs through Albany County and empties into the Platte near old Fort Laramie. There are 75 miles of splendid trout fishing on this stream, from Laramie City southwest. The Little Laramie, 15 miles from Laramie City, Horse Creek, Pale Creek, and the Chugwater, all within easy distance, are fine districts for fishermen. Twelve miles south from Laramie are Lakes Hulton and Creighton, which are now open for black and rock bass fishing, German carp and lake trout. The Fish Commissioner has placed three boats here for public use. Lake Hattie, 25 miles west from Laramie, contains a gamey variety of lake trout, weighing from 4 to 6 pounds. It is worth while to mention that in the autumn of 1889 eleven brook trout taken from the Little Laramie River weighed, dressed, 30 pounds. The fishing grows finer every year, it being the aim of Fish Commissioner Louis Miller to keep the streams and lakes thoroughly stocked. The season in Wyoming wherein it is lawful to fish with hook and line is from June 1 to October 15.

Commissioner Miller in his report for 1890, says:

"We took from November 10th, 1889, until February 5th, 1890, 820,000 Eastern Brook trout eggs; during the months of April and May we took 240,000 California rainbow trout eggs, and during the months of June and July we took 135,000 native Colorado eggs. We received from the United States hatchery, at Northville, Michigan, 200,000 lake trout eggs, and received from the same station 12,000 California rainbow trout eggs. It will be seen that we have handled during last season 1,402,000 eggs. This amount of eggs, if we had to purchase them at $2 per thousand, would have been an expense to the State of $2,800, besides the express charges and running the risk of transporting them. The loss of eggs during incubation of last season was about five per cent, and the loss of young trout, while being carried until the umbilical sac was absorbed, was ten per cent, or a total loss from the eggs and young fry of about fifteen per cent. This is a very good average, particularly when account is taken of the crowded condition of the troughs. We can estimate that we have raised for general distribution during the season just closed 1,000,000 of young trout, representing a cash market value of $10,000.

"The United States Fish Commissioner says that the amount of eggs we have taken at this hatchery is only beaten by one or two of the oldest hatcheries in the United States."

From the above brief but comprehensive extract from the report of the United States Fish Commissioner, it will be very plainly seen that the beautiful lakes and numerous mountain streams of this enterprising State are being rapidly stocked with the finest specimens of choice game fish that the world produces, and consequently from this time forward a new region is opened to the lover of piscatorial sports, where with rod and line he can spend many a pleasant hour—as it is safe to say that no other locality will surpass Wyoming as a resort for the pleasure-seeking disciples of Isaac Walton.

FORESTS AND THE PRODUCTION OF LUMBER.

The United States laws prohibiting the manufacture of lumber from forests and the public domain, except for the use of actual settlers, are not specially calculated to promote the growth of this important branch of industry.

It is no doubt a fact that the protection afforded by lumbermen and mill-owners to forests from the oft-recurring destruction by fire is greater than the amount of timber which they annually consume in manufacturing lumber.

Fire is the great destroyer of the forests, and the timber cut and used for all purposes does not, perhaps, reach 5 per cent of the total amount consumed by forest fires.

The use of timber by settlers, mill-men, and others under proper regulations would, in a great measure, prevent the spread of fires which every year devastate such vast areas.

This evil will soon correct itself, however; timber is growing scarcer each succeeding year in the present great lumber-producing regions of Wisconsin, Michigan, and other Eastern States, and the ever-increasing tide of immigration that is rapidly settling up the great western portion of the United States makes a new and extensive supply nearer the demand a case of absolute necessity.

The natural result of this demand will be the purchase and occupation of the immense timber districts of Wyoming by lumber manufacturers and mill-men, whose obvious interest it will be to accomplish by every legitimate means the protection of these forests from the terrible destruction by fire that has so often laid waste timber regions in other parts of the country.

The following is from a report on Wyoming, by Robert C. Morris, compiled for the United States internal commerce report for 1889:

"The timber area of Wyoming has been variously estimated from 7,000,000 to 15,000,000 acres, a variation probably owing to the fact that the sparsely-timbered land has been included in the large estimate. A recent estimate of the forest area of Wyoming, based upon 12,060 square miles, divides as follows:—

Counties.	Square miles.	Counties.	Square miles.
Laramie	80	Fremont	3,300
Albany	840	Crook	400
Carbon	1,300	Uinta	2,400
Sweetwater	40	Yellowstone National Park	1,340
Johnson	1,800		

"The forests of Wyoming are confined mainly to the mountain ranges between 4,500 and 10,000 feet above the sea sevel. Some of them are of wide extent, and the timber quite dense and heavy. The best timber is found in the southern part of the Big Horn Mountains, the central portions of the Laramie Range, Medicine Bow and Sierra Madre Mountains, and the northern spurs of the Uinta, which extend from Utah into Southern Wyoming. The Shoshone, Teton, and Snake River ranges also bear quite heavy forests. The timber upon the eastern extension of the Sweetwater Range and western portion of the Rattlesnake Mountains is light and scattered. The widest timbered area is in the northwestern part of the Territory, covering the Wind River, Shoshone, and other mountains of the main range, including the groups of the Yellowstone Park.

"There is considerable timber, mostly yellow pine, upon the Black Hills near the Dakota line. Measurements of the timber limits of various mountains have been made, which show the heights in their respective altitudes, above which coniferous trees—the hardiest of any species—will not grow. The timber line of Mount Washburn is 9,900 feet above sea level, while the altitude of that mountain is 10,388; the timber line of Mount Hayden, of the Teton Range, is 11,000 feet, while its altitude is 13,858 feet above the sea level; the timber line of the Wood River Range is 10,160, while its general altitude is 11,500 feet above the sea.

"Yellow and white pine and white spruce are the principal timber. Many regard the yellow pine as the best and most useful tree, while others think the white spruce furnishes the best timber for all purposes Lodge pole pine is the prevailing forest tree in a wide area along the mountain range north and south of Laramie. It is also common in the northwestern and other portions of the Territory. It often replaces the original growth after fires. These trees have an average growth from 8 to 12 inches in diameter, but are occasionally found 3 to 4 feet in diameter and 60 to 100 feet in height. Red cedar has a scattering growth along the foot-hills, and at lower elevation the streams are fringed with cottonwood, box-elder, willow, scrub oak, and other small shrubbery.

"The forest land of the Rocky Mountains is still largely owned by the general Government, and its presence is of vital importance. The principal demands upon the forests are for the manufacture of lumber for local use and for railroad-ties. Also large quantities of smaller timber are used for fencing and fuel. But little if any timber is exported. The consumption of railroad ties has been estimated at 500,000 per annum, and an equal amount is used for timbering the coal mines. The manufacture of charcoal in Uinta county was an important industry for use in the smelters of Utah and Montana until the discovery of coking coal in Colorado on the line of the Rio Grande Railroad several years ago. The native lumber is similar to the Eastern spruce lumber, and is suitable for all ordinary purposes in building except as a finishing lumber. It has too many knots to work smoothly, and the preference is therefore given to Oregon or Eastern lumber. It is estimated that between 30 and 40 per cent of all lumber used along the line of the railroad is imported, and is worth, planed, $40 to $60 per thousand. The native rough lumber is worth $15 to $30 per thousand, according to location. The average price along the railroad is about $20. In Johnson county, in 1887, there were 9 saw-mills, 3 operating by water-power and 6 by steam, having an average daily capacity of 6,500 feet. The product of those mills in 1887 was 4,856,378 of first-class lumber, and 2,381,235 of second-class lumber, 1,994,275 shingles, and 270,810 laths, all of which were used for home consumption. At Buffalo, Johnson county, rough lumber per thousand is worth $25, dressed flooring per thousand $35, shingles $5.50, and laths $8 per thousand. In Uinta county the product of the saw-mills in 1888 was 4,000,000 feet of lumber, on an average $20 per thousand, and 200,000 ties worth $30,000. Albany county produced an equal amount in 1888, while Crook, Fremont, and Converse counties produced sufficient to meet all the demands for home consumption.

"Little attention has been paid to the cultivation of timber except the native cotton-woods on timber claims; but in all the larger towns experiment has shown that at altitudes not exceeding 6,000 feet, all the hardier varieties of timber raised in the prairie States of Kansas and Nebraska can be successfully cultivated in Wyoming. At Cheyenne, which has an elevation of 6,040 feet, its citizens have been successful in raising, besides the native cotton-woods and box-elder, black walnut, maples, ashes, elms, locusts, apples, and all the hardy varieties of shrubbery. The experience of old residents in Nebraska is being repeated in both Colorado and Wyoming. In 1854, '55 and '56, the first settlers of Nebraska thought that the naked plains could never be transformed into groves of valuable timber. They discovered, however, that on bottom lands along streams, and where prairie fires were kept out, there was a spontaneous growth of valuable varieties of timber—oak, black walnut, elms, ashes, cotton-wood, willows, etc. Still later it was found by experience that native seedlings transplanted into carefully prepared soil did well on high uplands, out on the open prairie,—not only did well, but grew with remarkable vigor and rapidity, showing characteristics of excellence in quality. In time, through acts of the Legislature, creating a board of agriculture, and liberal legislative appropriations, keeping out fires, and other aids and precautions, tree-planting in Nebraska is conceded a success.

"It is estimated that in 1886, there were cut in Wyoming 8,000,000 feet of timber, outside of railroad and mine timber. With the exception of forest fires, it is conceded that no one agency consumes the forest so rapidly as do the railways.

"It is important that Congress set aside large forest reservations for the protection of the fountain heads of the great rivers, and the withdrawal from sale, entry, and the disposal under existing laws of such lands. The enactment of laws for the protection of forests, and the planting and cultivation of forest trees should be encouraged in the several Territories. When any Territory shall become a State, and shall have instituted good and sufficient forest laws there should be conveyed to such State, in trust, the public forest lands within its borders for the perpetuation of the forests thereon."

MINING.

The mining industries of Wyoming present, perhaps, the greatest possibilities of any of its resources. They comprise not only the precious metals, gold and silver, but inexhaustible quantities of coal, petroleum, iron, and soda. Copper, lead, tin, asbestos, mica, magnesium, sulphur, graphite, kaolin, fire-clay, glass-sand, and other valuable deposits exist, and many of them in large deposits. Building-stone is also abundant, including granite, marble, slate, sandstone, limestone, etc. It is shown that the area underlaid with coal exceeds 30,000 square miles, or equal to double the coal area of the great coal State of Pennsylvania. More than 2,000,000 tons of coal are annually mined, and the output is being constantly increased. The coal product already exceeds $5,000,000 annually

The oil region extends over a country more than 300 miles in length, and in districts averaging 50 by 100 miles in extent. Two hundred thousand dollars are said to have been spent within the past year in developing the petroleum industry. A number of flowing wells have been plugged, and only await better transportation facilities.

Gold quartz and placer mines are being profitably worked in several localities, and the mining of copper has also been found profitable; but, with the exception of coal, the mining industries can hardly be said to be developed. Wyoming is a great store-house of mineral wealth, and it will not be many years before it will employ the highest skill of capital and labor.

LABOR SUPPLY.

The conditions regulating the demand and supply of labor in Wyoming at the present time are about normal. There is, however, a more than usual demand for skilled mechanics and female house-servants.

The total number of Chinese employed in the State (largely in the coal mines) will not exceed 500, and the number is gradually diminishing each year.

The question of the cost of living and maintaining a family in Wyoming as compared with the States east of the Missouri, is one frequently asked and worthy of consideration.

Wages are probably 35 to 50 per cent higher here than in the Middle States, while the cost of living in towns and cities on the railroad is 10 to

20 per cent greater; in the outlying towns probably 20 to 35 per cent greater.

The following is a list of approximate current wages in Wyoming:—

Occupation.	Wages (per day.)		Occupation.	Wages (per month.)	
Carpenters	$2.50 to	$4.00	Cow boys (with board)	$25.00 to	$35.00
Machinists	3.00	5.00	Horse wranglers (with board)	20.00	40.00
Painters	2.50	3.50	Farm hands (with board)	20.00	35.00
Tinners	3.00	3.50	Sheep herders (with board)	20.00	35.00
Stone-cutters	3.00	6.00	Teamsters (with board)	20.00	40.00
Plasterers	2.75	4.00	Cooks (with board)	20.00	50.00
Roustabouts	1.50	2.00	House servants, men (with board)	20.00	35.00
Miners	2.00	4.00	House servants, woman (with board)	12.00	35.00
Coal miners	2.75	5.00	Railroad brakemen (without board)	60.00	75.00
Engineers	3.00	4.00	Butchers (with board)	50.00	75.00
Brick-layers	4.00	6.00	Lumbermen (with board)	35.00	40.00
Shoe-makers	2.50	3.50	Conductors	75.00	100.00
Gas-fitters	3.00	3.50			
Day laborers	2.00	2.50			
Upholsterers	2.50	3.50			
Cabinet-makers	2.50	3.50			
Plumbers	2.50	5.00			
Tailors	2.50	3.50			
Bakers	2.50	3.00			
Railroad trackmen	1.50	2.25			

Cost of Living.—The following are about the retail prices, at distributing points in Wyoming, of staple articles:—

Flour, first grade, Nebraska	per cwt.	$3.50 to	$4.50
Flour, second grade, Nebraska	do.	2.75	3.50
Potatoes	do.	.75	1.50
Beef	do.	6.00	8.00
Mutton	do.	6.00	8.00
Veal	do.	10.00	12.00
Bacon	per pound.	.10	.12
Lard, grocer's	do.	.10	.12
Chickens	do.	.18	.20
Turkeys	do.	.10	.25
Wheat	per cwt.	1.50	1.75
Corn, sacked, Nebraska	do.	1.00	1.75
Oats	do.	1.00	1.75
Corn meal	do.	1.50	2.00
Sugar, granulated	do.	8.00	10.00
Salt, Liverpool	do.		3.00
Kerosene	per gallon.	.25	.40
Coal	per ton.	2.50	6.25
Hay:—			
In towns	do.	9.00	15.00
On ranches	do.	5.00	12.00
Lumber:—			
Native, rough	per M.	16.00	30.00
First quality, planed	do.		40.00
California or Oregon, best	do.	50.00	60.00
Shingles:—			
Native	do.	2.50	3.00
Oregon cedar	do.	4.00	5.00
Wood:—			
Native pine	per cord.		5.00
Slabs	do.		3.50
Ice	per ton.	6.00	10.00

Clothing, dry goods, and other articles easily transported and bearing light freight charges, are but slightly higher in price than in Eastern and Middle States.

UNDEVELOPED RESOURCES.

The resources of this State are in a measure undeveloped. The live-stock industry is the oldest, but there remains much unoccupied territory in which to extend this industry, and improved methods in conducting the business are likely to be adopted.

Agriculture is successfully carried on in every county of Wyoming to a limited extent; but with the prospects of more extensive and better modes of irrigation, together with wider railroad facilities, it will become one of the leading industries, and, together with the live-stock industry, will probably rank first in the wealth of the State.

With the exception of coal, mining is yet in its infancy. The coal measures cover nearly one-third the entire area, and have scarcely been worked more than on the surface. The superior quality of much of the coal gives it a market more than 500 miles east and west of the State lines.

Wyoming is an empire in its undeveloped resources, and only awaits the advent of capital and well-directed labor to make it one of the great States.

SOCIAL PROGRESS.

The formation and establishment of a new Territory always draw within its borders heterogeneous elements. This was true in the history of Wyoming. Some of its towns had unsavory reputations during the time of the construction of the Union Pacific Railway and the first settlement of mining districts; but the rough element passed on, and a cultivated and enterprising class of young men, desiring to carve out a future for themselves, came to the Territory from the Eastern, Southern, and Middle States. These men had courage, muscle, and brain, and they gave life and business activity to the many industrial pursuits. The most of these men came unmarried, and, after becoming fairly settled in some remunerative employment or business, returned to their old homes and married, bringing wives from cultivated and refined circles, thus laying the foundation in Wyoming for a society that will compare favorably with any section of the United States in cultivation, refinement, hospitality, and all that goes with a high type of manhood and womanhood. The present inhabitants of Wyoming are homogeneous, distinctively American, and very energetic.

WOMAN'S SUFFRAGE.—The first legislative assembly of Wyoming in 1869 conferred upon women the right to vote, recognizing the principle that "equality is a natural right." Two years later there was an attempt made to repeal the law, but without success, and no effort has since been made to repeal or abridge the right of suffrage. No one will deny that woman's influence in voting has always been on the side of good government. The people favor its continuance, and it is not regarded as a matter of difference between political parties. The constitutional convention, composed of men from both parties, adopted almost unanimously the following provision:—

"The right of citizens of the State of Wyoming to vote and hold office shall not be denied or abridged on account of sex. Both male and female citizens shall enjoy all civil, political, and religious rights and privileges."

Religious Matters.—Churches in Wyoming are very numerous. All towns of any considerable size are represented by one or more denominations and generally by all the prominent religious societies. There are many handsome and costly church structures.

Wyoming forms a diocese of the Catholic Church, under the supervision of Bishop Burke at Cheyenne; and Wyoming and Idaho are a diocese of the Episcopal Church, presided over by Bishop Talbot, with residence at Laramie City.

LIBRARIES.

The State Library, which contained about 6,000 books in 1882, now has over 14,000 volumes, exclusive of the public laws and documents of the State. Constant acquisitions are being made to the library by the purchase of valuable law books from appropriations made by the Legislature and by donations.

The law providing for the establishment of county libraries, by levying a special tax of not less than one-eighth nor more than one-half mile for that purpose, has been taken advantage of by several counties, and the opportunities which they afford are highly appreciated by the public. In Cheyenne the Laramie county library contains more than 2,000 volumes, and 500 persons draw books regularly.

Nearly all the churches have libraries, and the district schools under the law are also provided with excellent libraries. The good work which these libraries accomplish cannot be overestimated.

WYOMING BY COUNTIES.

Wyoming, when organized in 1869, contained two counties (formerly under the territorial jurisdiction of Dakota); viz., Laramie and Carter.

At the present time the State is divided into ten counties, as follows:

Counties	Organized.	Length.	Width.	Area, omitting fractions.
		Miles.	*Miles.*	*Acres.*
Laramie	December, 1869	108	65	4,520,480
Albany	do	99	45	3,057,920
Carbon	do	108	72	4,976,640
Sweetwater	do	110	84	5,913,600
Uinta	do	275	55	9,680,200
Johnson	December, 1879	103	100	6,624,000
Fremont	March, 1884	192	105	12,942,400
Crook	January, 1885	103	100	6,624,000
Converse	January, 1887	108	70	4,850,000
Sheridan	do	100	30	1,920,000

ALBANY COUNTY.

This county contains an area of 4,450 square miles. Nearly 2,000,000 acres of this amount are on the Laramie plains, with an altitude of from

6,000 to 7,000 feet. A large portion of the land is adapted to agriculture. Very large crops of hay are annually provided, and oats, vegetables, etc., are successfully cultivated. Nearly the entire county affords fine grazing. The hills and high mountains surrounding the plains furnish an abundant supply of water, the principal streams being the Big and Little Laramie rivers and their tributaries.

Albany county is one of the most progressive and prosperous in the Territory.

Several large soda lakes are situated on the Laramie plains, covering hundreds of acres, and having deposits of soda from 10 to 40 feet in thickness. A large section of country is underlaid with coal and iron, and in the mountains are found numerous gold and silver mines, both lode and placer, some of which have been profitably worked. Plumbago, asbestos, kaolin, mica, etc., have been discovered within the county, and marble of excellent quality and many other varieties of superior building stone.

The surrounding mountains are heavily timbered, furnishing an abundance of lumber.

City of Laramie.—The principal trade center in Albany county is Laramie, the county seat. Its location has many natural advantages, and is, perhaps, the handsomest in the State. Laramie was first settled in 1868, during the construction of the Union Pacific Railway, but at the present time has a population of about 6,000. It is a supply point for ranchmen, miners, and the important railroad and manufacturing interests that have been located there. Extensive machine shops, employing several hundred men, are in operation; also a large rolling mill, a burnetizing establishment for the treatment of railroad ties, and chemical works for refining and preparation of the natural soda for market. Laramie has a flouring mill, glass works for the manufacture of window glass, a tannery, soap works, planing mill, and numerous other enterprises. The Wyoming University, in which the citizens of Laramie take great delight, is located here; also a private school and hospital under the care of Sisters of Charity. There is a substantial county court-house and jail, constructed of brick and stone, and fine school buildings, churches, residences, and business establishments. The city has one daily and three weekly newspapers and a religious monthly, three national banks, water and sewerage systems, electric light, telephone exchange, opera house, fine buildings erected by various fraternal societies, etc. Laramie is the home of the Episcopal bishop for Wyoming and Idaho. The State fish hatchery is within 5 miles of the city, and the United States penitentiary a half mile outside the city limits. Laramie, with many natural advantages, has a brilliant future.

CARBON COUNTY.

Bordering on Colorado, and situated in the center of the southern portion of the State, this county has an area of about 7,775 square miles. The principal business now carried on in the county is stock-raising and coal mining. There are also extensive quarries of building stone successfully worked, and gold and silver are mined a little in some parts of the county. Iron ore exists in immense quantities, and very excellent mineral paint has been largely manufactured here. Owing to its superior quality as a preservative of iron against rust, it has been used for painting the Brooklyn Bridge and elevated railway systems of New York. An analysis shows the following composition:—

	Per cent.
Iron peroxide	90.2
Sulphur and lime	1.4
Insoluble matter	7.2
Water	1.2
Total	100.0

Sheep-growing receives much attention, and is very successfully prosecuted. Nearly one-fourth of a million of sheep were sheared in 1889, averaging about 8½ pounds of wool per head. The sheep are of large size, healthy, and keep in splendid flesh the year round with no other feed than that obtained in grazing.

The beautiful sandstone from which the Wyoming capitol building is constructed came from the Carbon county quarry, situated 2 miles from Rawlins.

City of Rawlins.—This city is on the Union Pacific Railway, and is the county seat of Carbon county. Its altitude is about 7,000 feet. It is a short distance off the crest of the continental divide, where it is crossed by the Union Pacific. Rawlins has a population of between 2,000 and 3,000, is the terminus of the east and west mountain divisions of the railroad, and has round-houses and quite extensive machine shops, employing a large number of men. Rawlins is quite a distributing point, having trade with the outlying country a distance of about 200 miles north and south of the railroad. Daily and tri-weekly mail stages leave here for northern and southern points. The State penitentiary, to cost $100,000 when finished, is being constructed here, and the public school houses of the county and city are substantial and handsome buildings. The court-house, erected of stone, cost nearly $50,000, a public school-house $35,000, and one of the fine business blocks has been erected at an outlay of over $50,000. There are many other substantial business houses, besides residences, several churches, opera-house, etc. Rawlins has a weekly newspaper and one banking institution.

Carbon county has several other towns of considerable size. The town of Carbon, with a population of perhaps 2,000, is almost exclusively a coal-mining district. Dana and Hanna are new coal-mining places, and, on account of the superior quality of that product, they are likely to outgrow Carbon. The new town of Casper is in the northeastern part of the county. It is surrounded by a fine grazing country, the center of an extensive oil basin and numerous soda lakes. The town, which is less than two years old, has several large mercantile establishments, a bank, and weekly newspaper. Freight in large quantities is shipped from Casper to Landers and Fort Washakie.

Saratoga, so called on account of its hot sulphur springs, which possess rare medicinal qualities for rheumatism and kindred diseases, is in the southern part of the county, on the banks of the North Platte River. It is in the center of a good agricultural valley, with abundance of timber and mineral prospects in the surrounding mountains. A weekly newspaper is published here.

The towns of Bothwell and Bessemer, in this county, each have a weekly newspaper.

An enabling act, providing for the organization of the proposed county of Natrona, will include nearly one-half of the northern part of the present county of Carbon.

CONVERSE COUNTY.

Converse county has an area of about 7,000 square miles, and, though organized less than two years ago, has an assessment roll of over $2,000,000. The Cheyenne & Northern Railway, now under construction, will pass through it from south to north. The North Platte River, with its many tributaries, flows through the central portion of the county, and will furnish water to irrigate a very considerable portion of the county. Stock-raising is extensively carried on, also coal-mining, a great portion of the area being underlaid with coal. Much of the county is well adapted to agriculture, on account of its low elevation and abundant water supply. This industry is but little developed. Large deposits of iron ore, assaying from 60 to 70 per cent, and metallic iron are found in this county, and the Laramie Range has many excellent prospects, which assay in gold and silver from $65 to $250 per ton. Copper is also found accompanying gold and silver. Marble, limestone, gypsum, mica, glass sand, and potter's clay are also among its mineral resources. Pine timber is found in the hills and mountains, supplying native lumber at moderate prices.

DOUGLAS, the county seat, is located on the Platte River, and has about 800 inhabitants. The city is putting in a good system of water-works, has its streets well graded, good sidewalks, a handsome brick school-house, and numerous substantial business places and dwelling houses. A national bank is located here, and occupies a handsome brick and stone building. There are two weekly newspapers published at this point.

At Inez, 16 miles from Douglas, are the mines of the Fetterman Coal Company.

Glenrock and Lusk are towns in this county. Each has a weekly newspaper, a bank, and good business houses and residences. At Glenrock are the mines of the Dale Creek Coal Company. Lusk is on the Niobrara or Running Water River, in the midst of a splendid grazing country, where agriculture is carried on without irrigation. The soil is deep and rich, and good crops have been harvested.

CROOK COUNTY.

Crook county, organized in 1885, with a voting population of a little over 500, is one of the most promising counties in the State. Its area is 10,300 square miles. It is watered by the Powder, Little Powder, Cheyenne, Belle Fourche, and Little Missouri rivers and their numerous tributaries. Along these streams are fine farming lands growing every variety of grain and vegetables usually produced in Southern Dakota and Northern Nebraska. Very little irrigating is done in this county, the most of the lands in the valleys being adapted to agriculture without the artificial application of water. Wild fruits of the smaller varieties, such as plums, gooseberries, currants, berries, etc., grow plentifully. There is good timber in the eastern part of the county, and excellent grazing lands throughout. The building of a railroad has been hastened by the discovery of large deposits of good coking coal, and the mines are expected to furnish a vast tonnage for the railroad and supply coal to portions of Dakota and the northwestern part of Nebraska. Large quantities of this coal will find a market in the adjoining States and Territories on account of its coking properties, even where coal for necessary fuel purposes is furnished from other points.

There are tin mines upon which development work is being pushed in the eastern portion of the county. The great number of men that will necessarily be employed in the mining of coal, tin, and other minerals in Crook county will furnish a market for its agricultural products. Silver, lead, and copper are found in this county, and some work has been done toward their development, while the gold placer mines on Sand Creek have also been worked with profit. Gypsum is found in inexhaustible quantities, and superior building stone, including limestone, granite, porphyry, etc. Salt-producing springs have been discovered near Jenney's stockade, and an oil district in the same vicinity covers some 400 square miles.

CITY OF SUNDANCE.—Sundance, which is the county seat of Crook county, has two banks, two weekly newspapers, a substantial and imposing brick court-house, a system of water-works, a hose-house built of brick, and a town hall.

FREMONT COUNTY.

Fremont county, with an area of over 20,000 square miles, is the largest in the State. It contains perhaps more undeveloped wealth than any other county. Gold, silver, and the base metals are found in nearly all sections of the county. There are rivers or small streams in all the valleys, and the altitude in some parts of the county is less than 5,000 feet. Agricultural products, in a few localities, can be grown without irrigation, but the yield is greatly increased by using water.

Stock-raising is the principal industry. The county has no railroad within its borders, and its extensive basins of petroleum, immense beds of coal, and other products must await cheaper transportation than is now afforded.

The Shoshone Indian Reservation occupies a large portion of the central part of the county, and includes the fertile valleys of the Wind River. Some conception of the size and importance of this county can be had when it is stated that it is larger in area than Massachusetts, Rhode Island, and Delaware combined, and more than one-third to one-half of its area is suited to agricultural pursuits.

About 4,000 square miles of this county are underlaid with coal, besides vast deposits of soda and exhaustless fields of oil. Gold, silver, copper, iron, marble, granite, etc., are found in many localities; but aside from mining the precious metals, these resources remain undeveloped. This county is estimated to have produced more than $5,000,000 in precious metals; and quartz and placer mining are more active here than in any other part of Wyoming.

Lander.—The county seat of Fremont county is quite a prosperous town. It has a bank, two weekly newspapers, good schools, and a commodious and well-built court-house of brick and stone. This town is reached by stage from the Union Pacific at Rawlins, 130 miles south. The principal business comes from the south on the line of the Union Pacific. The Shoshone Indian Agency and the military post of Fort Washakie are located about 15 miles from the county seat. Lander has a flouring mill and is soon to have an electric-light plant. The town is well built and is provided with churches and good schools. The subject of incorporation as a city is under consideration.

JOHNSON COUNTY.

Johnson county has an area of nearly 10,500 square miles, comprising rolling plains, fertile valleys, and extensive forests. The range of mountains known as the Big Horn traverses almost its entire length, rising to an altitude of nearly 14,000 feet, while many of the valleys are less than 5,000 feet above the sea level. The county has no railroad and consequently no adjacent outlet for its surplus products. It is a good grazing country, and is not excelled by any other portion of the State as an agricultural region. Johnson county has vast oil and coal deposits and other minerals. It is one of the best watered divisions in the State; and, as the soil is good and much of its surface is favorable to cultivation, its agricultural possibilities can hardly be estimated. Timber in this country is very plentiful and furnishes the only supply of lumber that is used or needed by settlers. Johnson county has a prosperous fair association, organized in 1886. Meetings are held in June and September, and $10,000 are distributed in premiums and prizes.

City of Buffalo.—Buffalo, the county seat, is located on Clear Creek, 225 miles north of the Union Pacific Railway. The city has an electric-light plant, water-works, a $40,000 court-house, a $15,000 three-story brick flouring mill, good school buildings, national bank, two newspapers, several churches, and numerous brick residences and buildings. Fort McKinney, a regimental post, is situated two miles from the city. The scenery about the post and city is very fine. Telegraph and telephone lines connect the city with the fort and with railroad points. Buffalo has a good volunteer fire department, building association, and board of trade. Fraternal societies are well represented. A United States land office is situated here.

LARAMIE COUNTY.

This, the oldest county of Wyoming, covers over 7,000 square miles, and is located in the southeastern portion of the State. Being first in settlement, it is the most developed, and ranks first in wealth and population. The county slopes toward the eastward from the Black Hills of the Laramie Range and varies in altitude from 4,000 to 8,000 feet. Probably one-fourth of this county can be successfully irrigated from the numerous streams in all parts of the county. There is another portion upon which agricultural crops are being raised without irrigation, and the remainder is superior grazing land. The county now supports an immense number of cattle and horses and some sheep. There is a great variety of undeveloped resources in iron, coal, copper, gold and silver, marble, sandstone, granite, mineral paint, mica, etc., all being found in great quantity.

The county generally comprises rolling plain and level land easily broken and cultivated, being free from stone and obstructions. In exceptionally wet seasons the natural rain-fall is sufficient to produce grain and vegetables, and as the soil is rich, large crops are gathered. To insure a reliable crop, however, irrigating ditches and a supply of water are necessary. During a period of four months in 1886 there were recorded papers for over 500 canals and ditches, aggregating some 1,200 miles in length, and covering more than 200,000 acres of land in the southern and central portion of the county. The works of one irrigating company include 2 canals, 37 and 29 miles long, respectively, and from 20 to 30 feet wide, and a tunnel through solid granite nearly three-fourths of a mile long, large enough to admit a flow of 1,500 cubic feet of water per second. This enterprise is intended to reclaim over 50,000 acres of desert land, and cost $500,000. There are other companies that have expended from $20,000 to $75,000 each in irrigating ditches. The North Platte runs diagonally across this county, and the Laramie River, a large stream, empties into it from the south. Numerous large creeks, such as Horse Creek, Lodge Pole, Crow, and others, rise in the Laramie Range, skirting the western boundary of the county, and flow eastward across the county into Nebraska.

The Union Pacific Railway crosses near the southern line, and the Denver Pacific and Colorado Central run southward from Cheyenne. The Cheyenne & Northern runs northward across the county.

CITY OF CHEYENNE.—The county seat of Laramie county and capital of the State is on Crow Creek, in the southern part of the county. It is a well laid out, handsomely built city, and is noted for the enterprise of its citizens. It was designated as the capital of the Territory in 1869, and the adopted constitution for Wyoming makes it the State capital. Cheyenne is 516 miles from Omaha, on the Union Pacific, and is at the junction of the Cheyenne & Northern, Colorado Central, and Denver Pacific railways. Extensive shops of the Union Pacific are located here, which will cost between $2,000,000 and $3,000,000 when completed, and will employ 2,000 or more men. The amount expended in shop buildings and machinery the present year will exceed $500,000, and the force will be increased before the close of the year by about 500 men

Cheyenne has an extensive system of water-works, good sewerage system, fire department and fire alarm system, telephone exchange, electric and gas light in streets and buildings, opera house, club houses, expensive business blocks and elegant residences, ten churches, fo[illegible] banks with an average capital of over a million dollars, and three daily and three weekly newspapers. The city has three large public school buildings and another authorized to be built; a convent building erected at a cost of nearly $50,000; deaf, dumb, and blind asylum; county hospital; and also a capitol building. The city has a very handsome public park, covering four blocks, commodious hotels, street cars, and substantial and fine society buildings; such as Masons, Odd Fellows, Knights of Pythias, etc.

Fort Russell, three miles northwest of Cheyenne, is a permanent military post, the largest and most important in the Department of the Platte. It has lately been supplied with modern water and sewerage system, and the buildings for officers and men are of brick, containing all the modern improvements.

Cheyenne enjoys a free mail-delivery system. It is the supply point for an extensive stock-raising country adjoining. The city is justly noted for its buildings, numerous shade trees, lawns, stone and cement sidewalks, and perfectly graded streets. The State Fair Association grounds are a mile from the city. Cheyenne has a board of trade, a Young Men's Christian Association, with free reading-room and gymnasium, and fraternal societies are well represented. The Union Pacific has here a handsome station building of red and gray sandstone, 225 by 56 feet in size, two and three stories high, and costing over $100,000. The towns of Pine Bluffs, Granite Cañon, Silver Crown, Chugwater, Bordeaux, Uva, Wendover, Fairbanks, and others are in Laramie county.

SHERIDAN COUNTY.

This county occupies a position in the north central part of the State, is 100 miles from east to west along the line of Montana, and thirty miles north and south, giving an area of 3,000 square miles, or about 2,000,000 acres of land, which competent authority has divided as follows:—.

	Acres.
Agricultural	640,000
Grazing	900,000
Mountains, timber, etc	500,000

What this county needs more than anything else is railroads. It possesses many natural routes for railroads to approach from either north or south. The building of a railroad through the county will greatly stimulate all branches of trade, and add to the already increasing growth of the county, and it is hoped the next year or two will witness the advent of one or more roads. Sheridan is a new county, authorized by the Legislature in 1888, when it was taken from the northern part of Johnson county.

The financial condition of the county is good, and it has excellent prospects. It is, perhaps, the most advanced county in the State as regards agriculture, and abundant crops of grain and vegetables of the best quality are annually grown. The soil is rich and fertile, and an abundance of water to irrigate is constantly furnished from the Big Horn Range extending north and south across the county. When the rains are abundant, irrigation is unnecessary for moisture, but is useful here, as elsewhere, in fertilizing the soil. In this county stock-raising, combined with farming, is, perhaps, pursued to a greater extent than in any other, Nature has supplied this county with superior grasses in abundance, and the raising of live-stock, either in small or large herds, is very successful. Good schools, averaging seven months per annum, are established throughout the county. The average monthly salary of teachers is over $52. Church services, well attended, are held in nearly all parts of the county, and the organization of churches is advancing. The mineral resources are, to a great extent, undeveloped. Some gold and silver mining is done in the Big Horn Mountains, and copper is found in proximity. The county is rich in coal of fair quality, which is very accessible, being found in the hills adjoining farming lands. The quantity is inexhaustible, but is at present used only to supply the farmers and settlers. A large supply of timber is found in the mountains, and the lumber manufactured of it is of good quality and suitable for building purposes. There are eight saw-mills reported at work in the county. Timber is also found along the streams. This county has the distinction of having the first agricultural fair held in Wyoming.

Sheridan, the seat of government of this county, is beautifully situated near the junction of Big and Little Goose creeks. The town is surrounded on all sides by broad and fertile valleys, well watered and producing in abundance a large variety of agricultural products. No town in the State is situated in the midst of so extensive a farming region. good roads, well graded and bridged, being laid out in all directions. It partakes largely of the nature of the growing towns and cities of the grain-growing Western States. There are a dozen or more mercantile establishments, representing the different lines, and residences and general buildings in proportion. It has an artesian well, supplying pure soft water.

Sheridan county has other thriving towns.

SWEETWATER COUNTY.

This county contains nearly 10,000 square miles and enjoys the distinction of being the principal coal producing county in Wyoming. It is also adapted to stock-raising and agriculture. Green River flows through this county, and has many large tributaries, and the streams, as a whole, offer an almost inexhaustible supply of water with which to reclaim the dry but fertile lands. The Union Pacific Railway extends through the county from east to west. Capital is needed for extensive irrigation works. An eastern company are already at work on the Big Sandy, and their operations embrace the taking out of a large canal, the irrigation of an immense area, and the founding of a town and agricultural district.

Green River, the county seat of Sweetwater county, has not adopted a municipal government. The town is on the Union Pacific Railway where it crosses the Green River. It is the junction of two divisions on the main line of the Union Pacific and the Oregon Short Line division, and extensive repair shops are located here. The surrounding country is devoted to stock-raising, and coal-mining is extensively carried on within 15 miles. At this point water is taken from the Green River through a large system of water-works to supply the city of Rock Springs.

Rock Springs, in Sweetwater county, on the Union Pacific, is a mining city of some 3,000 inhabitants and is in the best coal-producing country in the Rocky Mountains. The Rock Springs coal is justly celebrated from the Pacific Ocean to the Missouri River. The city has a water-works system which cost exceeding $200,000. Its streets and buildings are lighted with arc and incandescent electric lights. It has a bank, two newspapers, two schools, four churches, a volunteer fire department, excellent commercial houses, suitable hotels and numerous residences. Perhaps no city or town in Wyoming is increasing in population, wealth, and general importance as rapidly as Rock Springs. Though situated in the much-abused Bitter Creek region, it is destined to become one of the large centers of population. The coal mines here furnish employment for over 1,500 men, and this number will be more than doubled in the not distant future. The city formerly contained some 800 Chinamen, but the number has been reduced about one-half, and these are gradually giving way to other classes of laborers.

UINTA COUNTY.

Uinta county covers over 15,000 square miles, equaling in area the old States of Massachusetts, Connecticut, and Delaware combined. In this county is the Yellowstone National Park. Stock-raising, coal-mining, agriculture, and the manufacture of lumber are the principal industries. The altitude ranges from 5,000 to 8,000 feet and the climate is good. The soil is rich and very productive. This county is well watered by the Bear, Green, Salt, and Snake rivers and their numerous forks and tributaries. The flow is rapid, furnishing good water-power for mills and factories and water for irrigation. Timber is abundant on all the mountains for lumber, fuel, and mining purposes. Perhaps more lumber is manufactured in this county than in any other in the State. The supply of coal in Uinta is practically inexhaustible. It exists in veins of from 4 to 40 feet thick. Oil springs have been discovered here from which are constant though small flows of oil. The Union Pacific crosses the county in its southern portion, and the Oregon Short Line in the south central portion. In addition to coal and oil, there are found gold, silver, lead, asphaltum, asbestos, gypsum, kaolin, iron, etc., but these are undeveloped. Cattle, sheep, and horses do remarkably well in this county, and trotting horses are produced equal to the famous stock of Kentucky. Many first premiums for racing in adjoining States and Territories have been taken by Uinta horses the present season.

City of Evanston.—This city is the county seat, has a population of over 2,000, and is one of the most prosperous and promising towns in the State. It is pleasantly situated in the Bear River Valley, with many natural advantages. It is the home of wealthy cattlemen, mine owners, and bankers, and is improving very rapidly. The Union Pacific shops, located here, employ a number of skilled mechanics. The city has two banks, two newspapers, five churches, good school-houses, electric-light plant, water-works, and other improvements. The State insane asylum is situated here, and also the United States land office for the Evanston district.

Almy, 3 miles west, has nearly as many inhabitants as Evanston. About 1,000 men are employed there in coal mining.

YELLOWSTONE NATIONAL PARK.

Governor Warren, in his interesting report for 1889, says:—

"During the month of August last I visited the Yellowstone Park, spending a week in that wonderful region. While the Park is a reservation directly under the control of the general Government, yet it lies almost wholly within the boundary of Wyoming and is justly regarded with pride by all its citizens. I trust that some suggestions which have occurred to me in relation to the enlargement and preservation of the Park will not be unacceptable.

"The Yellowstone National Park occupies an area reported as 61.8 miles long by 56.6 miles wide, in the northwestern corner of Wyoming, with the exception of about 2 miles which project on the northern border of Montana, and a strip of about the same width extending over into Montana and Idaho on the west. It can be described as a region of hot springs and geysers, mountains, cañons, lakes and waterfalls. The beauty and grandeur of its scenery are not excelled by any locality. Here are found the largest and most numerous geysers in the world. No less than seventy of these are active geysers, some of which throw up columns of boiling water and steam over 250 feet in height, while there are thousands of boiling hot springs in whose depth are reflected all the prismatic colors of the rainbow. Besides the geysers are majestic mountains, beautiful lakes and rivers, with numerous cascades, rapids, and waterfalls. The Lower Falls of the Yellowstone are over 350 feet in height, and with its Grand Cañon are not surpassed by any scenery in the world. Differing from the splendors of Niagara or the Yosemite, it is no less impressive.

"Although exploring parties have at various times passed on all sides of this most curious region, its wonders remained undiscovered until 1870, and it was not until 1872, after the explorations of Dr. F. V. Hayden, that it was withdrawn from settlement and set apart for all time as a pleasure ground for the people. It is not strange that the Park remained thus unexplored, situated as it was on a plateau 8,000 feet above the sea-level, and surrounded on all sides by lofty mountains, the sides of which were covered with a dense growth of pine forests, and snow-capped summits 10,000 to 13,000 feet high. The only approaches to the Park were over these mountains, filled with fallen timber, or through deep cañons, whose precipitous heights and rushing rivers made them dangerous and well-nigh impassable. Having crossed the mountains or passed through one of the deep gorges, the surface of the Park is found to be undulating, and since roads have been cut through the various points of interest are easily accessible. The Mammoth Hot Springs, Norris Basin, Lower and Upper Geyser Basin, Yellowstone Lake, and the Grand Cañon and Falls of the Yellowstone are the principal points visited by tourists, and embrace a circuit of about 150 miles by stage or private conveyance.

"RAILROADS, STAGES, AND HOTELS.—The hotels in the Park are managed by the Yellowstone Park Association under certain restrictions of the

Government. They afford comfortable accommodations at $4 per day. Wagons, saddle horses, and guides can be obtained at reasonable rates. The Union Pacific Railway sells round-trip tickets to the Park via Beaver Cañon, on the Utah Northern Railway, from the west. The season in the Park is limited to between the 15th of June and the 30th of September. When parties desire to remain in the Park more than the limited time specified in their tickets, they should be allowed to do so. The present system of hastening people through is frequently very inconvenient, and could be better regulated. It is true, stop-over tickets or checks are provided for in the regulations of the Interior Department, but practically it is a dead letter, as no extra transportation is kept at intermediate points. The tourists are required to take the chances of securing room in following stages where a place is surrendered in the stage or wagon started in. As every vehicle is supposed to start out from the initial point with a full load of passengers, it can be readily seen that until a full load desire to stop over together, passengers cannot take advantage of the stop-over privileges accorded by the Department regulations. If enough transportation service were provided by the Yellowstone Park Transportation Company at all hotel points it would accommodate reasonably well all tourists desiring to stop over.

"There is also need, on the part of people of modest means, of cheaper hotel accommodations, but this I understand is to be provided for next season by the hotel company. It would also be a great convenience if there were places where supplies could be bought at reasonable prices by campers or persons visiting the Park. The hotels as now conducted in the Park are in the main very satisfactory, and if the Transportation Company would show less disposition to crowd and rush tourists through the Park there would be less cause for complaint. The company furnishes a good class of animals and vehicles.

"The usual time spent by tourists in the Park is from three to seven days, but more than twice that time could be taken up in visiting the many places of interest. New objects are constantly being discovered that add to its almost endless attractions. A steamboat to be launched next season in Yellowstone Lake will open up a score of places along a shore line 112 miles in length. This beautiful sheet of water of irregular shape is about 30 miles long, with an average width of from 12 to 15 miles. There are besides in this vicinity the beautiful Shoshone Lake and Heart Lake under the shadow of Mount Sheridan. It is in this vicinity that the Utah Northern (Union Pacific) has projected a road to be built in the near future, enabling tourists to reach the Park at its southern extremity. From Beaver Cañon the distance is nearly 100 miles to the lower Geyser Basin through a beautiful mountain region that affords fine hunting and fishing just outside the Park. A stop may be made midway, at Henry Fork, a tributary of Snake River, a place that has the reputation of being a paradise for the huntsman.

"MILITARY PROTECTION.—Capt. F. A. Boutelle of the First U. S. Cavalry, now superintendent of the Park, has in his service two companies of cavalry, comprising 160 soldiers, one company being in command of Capt. P. S. Bomus. Through the courtesy of Captain Boutelle I have been permitted to examine his report for the fiscal year ending June 30, 1889, and I most heartily concur in the recommendations therein contained, especially his request for an appropriation of $100,000 to clear up the fallen timber and prevent the destruction of growing timber.

"The paramount need of the Park is more adequate protection against the spread of forest fires. Without it the vast timber area in and around the Park is in danger of being destroyed. Such a calamity would not only greatly detract from the beauty of the Park, but work incalculable damage to the streams that have their headwaters in this region. Everything has been done to prevent fires that the limited means at the disposal of the superintendent would admit of; but his efforts are likely to be fruitless unless the Government comes to his aid by liberal appropriations. The forests are full of fallen timber, and the recommendation that it be cleared away at least 100 yards on each side of the traveled roads is important. It is usual for campers to build fires on the roadside, and the taking away of this timber would remove one of the most frequent causes of forest fires. There should be provided rubber buckets for the Park guards that could be filled at the nearest streams or tanks conveniently located to extinguish fires. Another precaution would be to give the superintendent power to designate certain points for camping purposes.

"Under the present circumstances the establishment of a military headquarters for the purpose of protecting the Park is the best arrangement that can be made. The cavalry make excellent police for a domain covering over 3,500 square miles."

WYOMING EPITOMIZED.

Wyoming is in size the eighth State in the Union. It is more than ninety-seven times the size of Rhode Island.

The State has nearly 100,000 square miles of area, 63,000 population, $100,000,000 of wealth, and extensive undeveloped resources.

About 30,000 square miles of the State are underlaid with coal; but excepting coal, the mineral wealth of Wyoming has been but slightly developed. The extensions of railroads now being built and projected will early bring about great changes and rapid development.

Wyoming will perhaps become more noted for her oils than any other product. Oil is found in large areas, some of the basins reaching 30 by 150 miles.

Mountains of iron and generous deposits of gold, silver, copper, lead, mica, cinnabar, tin, sulphur, soda, salt, borax, asphaltum, gypsum, graphite, magnesium, asbestos, kaolin, and mineral paint are found; also marble, sandstone, limestone, granite, slate, and other decorating and building stones.

The mineral wealth of Wyoming is more than sufficient to pay the National debt, as will be demonstrated by future development.

Natural gas is believed to exist, but no considerable discovery has yet been made.

Brick clay exists in all parts of the State.

One hundred and fifty thousand horses and mules, 1,500,000 cattle, and 1,250,000 sheep graze on the ranges of Wyoming.

Nutritious grasses, curing where they grow, furnish abundant food for both domestic animals and wild game.

Irrigation is largely depended upon to raise farm products, yet small grains, grasses, and vegetables are raised without irrigation over a very considerable area. With irrigation alfalfa makes from two to four crops a year, and grains and vegetables make a phenomenal yield.

The Union Pacific Railway runs nearly 500 miles through Southern Wyoming. The Denver Pacific runs south from Cheyenne, also the Colorado Central; both are branches of the Union Pacific. The Cheyenne & Northern runs north from Cheyenne. The Oregon Short Line division of the Union Pacific runs northwest from Granger, in the western portion of the State.

The climate of Wyoming is cool in summer and mild in winter, with but few snow-storms, which are usually accompanied by wind, preventing a complete covering of the ground. While subjected to occasional heavy snow-falls, the average winters are neither severe nor long. There are few cloudy and many sunny days, and it is healthful in the highest degree.

The many rivers of Wyoming, with their numerous branches, water very large tracts of land, and also furnish food fishes.

Wild game abounds in nearly every portion of the State, and its wanton slaughter is prohibited by law.

A very large portion of the public lands is yet unsurveyed, and much of that surveyed is still unoccupied.

There is room for all, in agricultural pursuits, mining, stock-raising or other business.

The birds in Wyoming include over one hundred and twenty-five species.

Yellowstone National Park is nearly all within the borders of Wyoming. Its scenery and its wonderful freaks of nature are unequaled in the world.

Business in Wyoming is generally prosperous, notwithstanding the present low prices of the cattle product.

There are thirty-one newspapers printed in the State, four of them dailies.

The people of Wyoming are of high average in education and general habits. The early settlers came from nearly every part of the world, but later they came chiefly from the Eastern and Southern States.

Public schools are maintained throughout the State, and teachers are carefully selected.

The church edifices are very numerous, and many of them are costly and of high order of architecture. They are very generally attended.

The laws of Wyoming are good, and generally applicable to the country, and the people are law-abiding.

No fatal contagious diseases exist among live stock, and the State constantly employs an efficient veterinary surgeon to prevent the dissemination of disease. Quarantine laws and sanitary regulations are maintained.

The State created the office of mining inspector to secure the safety of the men employed in coal and other mines.

The office of State geologist is maintained to encourage the development of mining.

The office of State engineer provides a skillful official, whose duties are to encourage, superintend, and control irrigation.

The State has a fish hatchery for the purpose of stocking streams not already provided, and a competent fish commissioner is in charge.

The social status of Wyoming is excellent. Societies, literary, social, secret, and others, are well represented and satisfactorily supported.

Wyoming has a law library of 15,000 volumes. There are laws providing for free county libraries, found in the larger towns, a small tax being levied for their support.

The flora of the State comprehends, in addition to flowering plants, large varieties of grasses, and some sixty species of mosses, lichens, and various species of tree flora, the latter more fully described under the heading of timber and lumber supply.

The fauna of Wyoming is extensive in its genera and species. Perhaps no State or Territory excels in this. Some fifty species of food-fishes abound in our water-courses and lakes.

Some thirty species of mammals abound, including game animals.

Wyoming now has a population more than double that of either Alabama, Missouri, Ohio, Oregon, Illinois, and some other States, when admitted.

Woman's suffrage, first adopted in 1869, is favored by both political parties.

Wyoming is becoming noted as a resort for those in search of health and strength and the highest physical development.

The Indians of Wyoming are not war-like, and efforts are being made to educate them in farming and other industrial pursuits.

The mail service is fair; but in many localities more mail routes and better facilities are needed to accommodate the inhabitants and to assist in developing the State.

Financial standing in the State—public, private, and corporate—is high.

There are two companies of Wyoming National Guards, already organized and equipped.

Wyoming has one county, Fremont, with an area equal to that of Massachusetts, New Jersey, Delaware, and Rhode Island combined.

The coal area of Wyoming is twice as large as that of Pennsylvania.

The mineral paint of Wyoming is the best ever used on bridges, roofs, and other structures exposed to the elements.

The people of Wyoming have $10,000,000 invested in irrigating canals, ditches and reservoirs, which is not included in the assessed valuation of the land on which the same are located.

The high mountain ranges of the State shield its valleys from the severe blizzards so common in some of the Western States and Territories.

The scenic features in Wyoming are remarkable. Meadows and great natural parks are encircled by lofty and majestic snow-capped mountains, their sides covered with forests, innumerable streams, great water-falls, and extraordinary and fantastic rock formations, and other grand and beautiful scenery.

The census of 1880 shows that Wyoming has the smallest percentage of illiteracy of any political division of the United States. The people are generally young, vigorous, industrious, and of high character.

Wyoming has a State agricultural fair in addition to a number of county fairs.

Rain-fall in Wyoming averages on the plains about 14 inches; on the mountains perhaps three times as much.

There are twenty banks in Wyoming.

Interest rates are from 6 per cent to 12 per cent.

Live stock and mining industries furnish an excellent market for all kinds of produce.

Wyoming public buildings comprise the capitol, university, fish hatchery, penitentiary, poor farm, asylum for deaf, dumb, and blind, and asylum for insane.

The cities and towns of Wyoming have a high class of municipal buildings.

Her undeveloped resources are abundant and very promising, simply needing brains, money, and muscle.

Wyoming has several telephone exchanges and fair telegraphic advantages.

Under the present administration all appointees of the State have been *bona fide* residents.

In 1886 the total acres of land assessed was 394,789; in 1889 it was 5,868,370.

Wyoming has already nearly 500 miles of main trunk line of Union Pacific Railway.

The mean altitude is about 6,000 feet, ranging from 3,000 to 14,000.

Wyoming has numerous advantageous sites for the easy construction of large storage reservoirs.

The State produces annually a large amount of hay. Small grains do remarkably well. The soils are generally rich, the only fertilizer needed being water. The sage-brush districts raise good crops when subjected to irrigation.

Four-fifths of the counties in Wyoming have substantial and commodious brick or stone court-houses.

Wyoming is the youngest of the States. It is 275 miles north to south and 369 east to west, forming a parallelogram.

School houses and school property in the State are worth $1,000,000. Wyoming has a compulsory school law, and the teachers are carefully selected.

Heavy forests cover over 7,000,000 acres of Wyoming, and there are about 15,000,000 acres having more or less timber.

School and university lands are rented in Wyoming, and rental applied to support the public schools.

Wyoming cast a vote of 18,010 in 1888.

The streams of Wyoming furnish water enough to irrigate 18 to 20 per cent of its area.

Wyoming has 600 streams already used to some extent for irrigation, and a great many more from which no ditches have been taken.

The number of recorded ditches is over 2,600, and there are more than 5,000 unrecorded.

The total length of irrigation ditches is over 5,000 miles.

DISTANCES.

OFFICIAL DISTANCES FROM CHEYENNE, WYO., TO THE FOLLOWING PLACES (TAKEN FROM THE TABLE PREPARED BY AUTHORITY OF THE SECRETARY OF WAR).

Places.	Distance in Miles.	Places.	Distance in Miles.
Boston, Mass	2,151	Jacksonville, Fla	1,961
Baker City, Oregon	946	Kansas City, Mo	716
Blackfoot, Idaho	505	Laramie, Fort, Wyo	88
Boulder, Colo	92	Laramie City, Wyo	57
Carter, Wyo	388	Lincoln, Neb	455
Chicago, Ill	1,006	Little Rock, Ark	1,186
Cincinnati, Ohio	1,283	Los Angeles, Cal	1,552
Cleveland, Ohio	1,350	Louisville, Ky	1,194
Custer, Fort, Mont	449	McKinney, Fort, Wyo	322
D. A. Russell, Fort, Wyo	3	Milwaukee, Wis	1,036
Davenport, Iowa	836	Minneapolis, Minn	880
Deming, N. Mex	808	Montreal, Canada	1,843
Denison, Tex	1,038	New York City, N. Y	1,918
Denver, Colo	106	Ogden, Utah	515
Des Moines, Iowa	660	Omaha, Neb	516
Detroit, Mich	1,278	Philadelphia, Pa	1,827
Dubuque, Iowa	853	Portland, Oregon	1,309
Evanston, Wyo	439	Providence, R. I	2,011
Fetterman, Fort, Wyo	180	Rawlins, Wyo	198
Fort Worth, Tex	1,189	Rochester, N. Y	1,582
Fred Steele, Fort, Wyo	176	St. Louis, Mo	929
Fremont, Neb	470	Salt Lake City, Utah	552
Galveston, Tex	1,432	San Diego, Cal	1,649
Granger, Wyo	369	San Francisco, Cal	1,248
Green River	379	Santa Fe, N. Mex	586
Hartford, Conn	1,989	Sidney, Neb	102
Helena, Mont	932	Washakie, Fort, Wyo	340
Indianapolis, Ind	1,128	Washington, D. C	1,819
Jackson, Miss	1,414		

ALTITUDES.

CITIES, TOWNS, CAMPS, AND FORTS.

Names.	Altitude.	Names.	Altitude
	Feet.		*Feet.*
Archer	6,065	Hallville	6,500
Aspen	7,809	Hampton	6,500
Almy	6,820	Harney	7,868
Atlantic City	7,666	Hartville	4,700
Barrel Springs	6,854	Hazard	6,357
Baxter	6,300	Hillsdale	5,686
Bitter Creek	6,675	Howell	7,090
Black Butte	6,548	Independence Rock	6,187
Boleter	4,325	Jackson's Hole	6,000
Bridger	6,758	Laramie City	7,143
Bryan	6,323	Latham	6,900
Buford	7,808	Lander	....
Camp Brown (old Fort Washakie)	5,447	Lawrence	6,200
Camp Brown	5,496	Leroy	7,100
Camp Stambaugh	7,767	Lookout	7,184
Camp Walbach	6,449	Marston	6,345
Carbon	6,758	Medicine Bow	6,560
Carter	6,530	Miller	5,908
Cheyenne	6,075	Millis	6,790
Cheyenne Signal Bureau	6,058	Miser	6,824
Church Buttes	6,298	Mud Volcanoes (Yellowstone Park)	7,712
Como	6,691	Otto	6,754
Cooper's Lake	7,061	Pacific Springs	7,144
Creston	7,036	Percy	6,955
Dana	6,878	Piedmont	6,500
Deer Creek Agency, abandoned	5,000	Pierre's Hole	6,515
Devil's Gate	6,028	Pine Bluff	6,400
Egber	5,307	Point of Rocks	5,061
Encampment Meadows	8,171	Rawlins	6,730
Evanston	6,870	Red Buttes	7,360
Fairbank	4,690	Red Desert	6,703
Fillmore	6,885	Rock Creek	6,709
Fort Aspeneut, abandoned	7,690	Sand Creek	....
Fort Bridger	6,753	St. Mary's	6,965
Fort Fetterman (Platte bottom)	4,973	Salt Wells	6,756
Fort Halleck, abandoned	7,800	Separation	6,897
Fort Laramie	4,519	Sherman	8,269
Fort Phil Kearney, abandoned	6,000	Simpson	6,904
Fort Piney, abandoned	7,560	South Pass	7,857
Fort Russell	6,455	Sulphur Springs (Yellowstone Park)	7,068
Fort Sanders, abandoned	7,166	Sun Dance	....
Fort Stambaugh, abandoned	7,684	Sweetwater Bridge	7,000
Fort Steele	6,841	Table Rock	6,881
Gardner's River Spring (Yellowstone Park)	6,100 to 6,500	Three Crossings	6,134
Geyser Basin, Lower	7,250	Walback Springs	6,297
Geyser Basin, Upper	7,400	Walcott's	6,800
Granite Cañon	7,327	Washakie	6,691
Granger	6,252	Wilcox	7,033
Green River	6,124	Wyoming City	7,066
Greenville	6,560		

MOUNTAINS.

Name.	Mountain range.	Altitude.
		Feet.
Big Horn		8,000 to 12,000
Black Butte		8,176
Bradley's Peak	Seminoe	9,500
Chimney Peak	Laramie	8,168
Chimney Rock	Wind River	11,853
Deer Mountain	Park	8,377
Delham Peak	do	11,594
Mount Doane	Yellowstone	10,118
Elk Mountain	Medicine Bow	11,511
Flat Mountain		9,704
Fremont's Peak	Wind River	13,570
Grand Encampment	Park	11,006
Mount Hayden	Teton	13,858
Mount Haystack		7,689
Inyan Cara	Black Hills	6,700
Iron Mountain	Laramie	6,908
Laramie Peak	do	11,000
Laramie Range		7,000 to 9,000
Medicine Peak	Park	12,231
Medicine Bow		8,000 to 12,000
Mount Moran	Teton	12,800
Muddy Mountain	Park	8,012
Park Range, in Wyoming		11,500
Phlox Mountain	Owl Creek	9,136
Pine Bluff		8,878
Quaking Aspen		8,688
Quien Hornet	Uinta	9,300
Rawhide Peak		6,370
Red Mountain		9,866
River Butte		7,872
Rock Mountain		6,885
Sailor Mountain		10,046
St. Mary's Peak		7,729
Sander's Peak		9,077
Seminoe Mountains (highest)		10,500
Sheep Mountain	Park	9,758
Sheep Butte	Medicine Bow	9,722
Mount Sheridan		10,420
Mount Steele	Medicine Bow	7,771
Table Rock		7,551
Washakie	Uinta Range	7,984
Washakie Needles		12,253
Mount Washburn		10,388
Young's Peak	Seminoe	9,000

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